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GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 348

PROFILE SURVEYS
IN
HOOD AND SANDY RIVER BASINS
OREGON

PREPARED UNDER THE DIRECTION OF

R. B. MARSHALL, CHIEF GEOGRAPHER

WASHINGTON
GOVERNMENT PRINTING OFFICE

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GEORGE OTIS SMITH, DIRECTOR

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PROFILE SURVEYS
IN
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PROFILE SURVEYS IN HOOD AND SANDY RIVER BASINS, OREGON.

Prepared under the direction of R. B. MARSHALL, Chief Geographer.

HOOD RIVER DRAINAGE BASIN.

GENERAL FEATURES.

Hood River drains the northern slopes of Mount Hood. It is formed by the junction of the East and West forks, which drain opposite sides of the mountain, and flows northeastward into Columbia River at the town of Hood River. The waters of the stream are used for both water power and irrigation, and, as they are supplied from the glaciers on the mountain, the flow is well maintained through the summer months. The drainage area is heavily forested, although part of the area was burned many years ago. The mean annual precipitation at Hood River is 36 inches. The valley of the stream is noted for its apples, berries, and other fruit. The results of profile surveys in the Hood River basin are given in Plate I (at end of volume).

GAGING STATIONS.

The Geological Survey has maintained in the basin of Hood River the gaging stations indicated by the following list. The stations are arranged in downstream order, the position of tributaries being indicated by indention. A dash after a date indicates that the station was being maintained June 30, 1913. A period after a date indicates discontinuance.

Hood River at Dee, Oreg., May 21, 1913—
Hood River at Winans, Oreg., 1905–7; 1910—
Hood River near Tucker, Oreg., 1897–99; 1913—
Hood River at Hood River, Oreg., 1913—
    East Fork of Hood River near Mount Hood, Oreg., 1913—
    East Fork irrigation canal near Mount Hood, Oreg., 1913—
    West Fork of Hood River near Dee, Oreg., 1913—

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SANDY RIVER DRAINAGE BASIN.

GENERAL FEATURES.

Sandy River heads in the glaciers of Mount Hood, flows northwestward, and unites with Columbia River at Troutdale. It drains the western slope of the Cascade Mountains at their northern extremity in Oregon. The principal tributaries are Bull Run River, which drains the Oregon National Forest and furnishes the water supply for the city of Portland; Salmon and Little Sandy rivers, and Zigzag, Camp, and Still creeks. The drainage area includes 521 square miles at the mouth of the river, 228 square miles above the mouth of Bull Run River, and 118 square miles above the mouth of Zigzag Creek. The drainage area of Bull Run River at the mouth is 168 square miles.

The mean annual precipitation at Bull Run is 76 inches; at Government Camp, 87 inches. It is likely, however, that the figure for Government Camp is not representative, because of the close proximity of the station to Mount Hood. A large part of the precipitation on the headwater region falls as snow. In the foothills, however, it nearly all appears as rain during the nine months from September to May. The value of the waters of this stream lies in their availability for municipal water supplies and in the water power that can be generated by them. Favorable sites for power development are numerous and the distance from any of them to an industrial center is not great. A large part of the drainage area is heavily forested. There are many areas from which the timber was burned a good many years ago, but these areas have grown up in second-growth timber and the underbrush is almost impenetrable.

As is usual with glacier-fed streams, a protracted period of cold weather is likely to cause for a short time in winter a lower discharge than the natural low-water flow in the summer.

The best storage site in the basin is probably at Summit Swamp, on Salmon River, in secs. 6, 7, and 18, T. 4 S., R. 9 E., where about 60,000 acre-feet of water can be impounded with a 150-foot dam. At Bull Run Lake the water leaks through a natural dam of glacial bowlders. The natural storage thus provided probably could not be augmented artificially except at a prohibitive cost.

The results of profile surveys in the Sandy River basin are set forth in Plate II (at end of volume).

GAGING STATIONS.

The Geological Survey has maintained in the basin of Sandy River the gaging stations indicated by the following list. The stations are arranged in downstream order, the position of tributaries being indi-

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cated by indention. A dash after a date indicates that the station was being maintained June 30, 1913; a period after a date indicates discontinuance.

Sandy River above Salmon River, at Brightwood, Oreg., 1910—
Sandy River below Salmon River, near Brightwood, Oreg., 1907–1911.
Sandy River near Marmot, Oreg., 1911—
Sandy River above Bull Run River, near Bull Run, Oreg., 1910–1912.
Sandy River below Bull Run River, near Bull Run, Oreg., 1910—
Clear Fork of Sandy River, near Welches, Oreg., 1913—
Lost Creek, near Welches, Oreg., 1913—
Zigzag Creek, at Rowe, Oreg., 1910–1913.
Still Creek, near Rowe, Oreg., 1910–1912.
Salmon River, near Rowe, Oreg., 1910–1912.
Salmon River, at Welches, Oreg., 1913—
Salmon River, near Brightwood, Oreg., 1912–13.
Bull Run River, near Bull Run, Oreg., 1907—
Little Sandy River, near Marmot, Oreg., 1913—
Little Sandy River, near Bull Run, Oreg., 1911–1913.
Little Sandy River flume, near Bull Run, Oreg., 1911–1913.

PUBLICATIONS.

The following publications of the Geological Survey contain the results of investigations of stream flow at the stations indicated in the preceding lists:

Hood River basin:
Annual Reports: Nineteenth, Part IV; Twentieth, Part IV; Twenty-first, Part IV.
Water-Supply Papers: 16, 28, 38, 178, 214, 252, and 362.[1]
Sandy River basin:
Water-Supply Papers: 252, 272, 292, 312, 332,[1] 362.[1]

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C. The edition printed for free distribution is, however, small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will on application furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

[1] In preparation June, 1914.

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4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
St. Paul, Minn., Old Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., Federal Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., Federal Building.
Santa Fe, N. Mex., Capitol Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications may be obtained by applying to the Director of the United States Geological Survey, Washington, D. C.

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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 349

PROFILE SURVEYS
IN
WILLAMETTE RIVER BASIN
OREGON

PREPARED UNDER THE DIRECTION OF
R. B. MARSHALL, CHIEF GEOGRAPHER

Prepared in cooperation with
THE STATE OF OREGON
John H. Lewis, State Engineer

WASHINGTON
GOVERNMENT PRINTING OFFICE
1914

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II. A–D, Plan and profile of Clackamas and Collawash rivers above Cazadero, Oreg. At end of volume.

III. A–E, Plan and profile of North Fork of Santiam River and tributaries above Lyons, Oreg. At end of volume.

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PROFILE SURVEYS IN WILLAMETTE RIVER BASIN, OREGON.

Prepared under the direction of R. B. MARSHALL, Chief Geographer.

GENERAL FEATURES OF WILLAMETTE RIVER BASIN.

Willamette River drains a trough-shaped area extending north and south between the Coast and Cascade ranges in Oregon. The area is roughly rectangular, approximately 140 miles in length and about 85 miles in width. The Willamette proper is formed by the junction of three main tributaries which unite in the vicinity of Eugene; these are the Middle Fork (considered the continuation of the main stream), the Coast Fork, and McKenzie River. The river is navigable for ocean-going vessels from the mouth to Portland, and for ordinary river steamboats from Portland to Corvallis, except during a few months of each year. From Corvallis to Eugene the river is navigable for light-draft boats during medium stages of the river. The falls of Willamette River at Oregon City are passed by a series of five locks, which are at present in private ownership.

The other principal tributaries of Willamette River are Santiam, Molalla, and Clackamas rivers. From the Coast Range flow Long Tom, Marys, Luckiamute, Yamhill, and Tualatin rivers. The drainage areas of this river and its principal tributaries are given below.

Drainage areas in Willamette River basin.

	Square miles.		Square miles.
Willamette at mouth	11,150	McKenzie River	1,040
Willamette at Oregon City	10,200	Santiam River	1,890
Willamette at Salem	7,520	Yamhill River	763
Willamette at Albany	4,860	Clackamas River	927
Coast Fork of Willamette	705	Tualatin River	690
Middle Fork of Willamette	1,450		

From the summit of the mountain ranges the slopes are steep, but they merge gradually into a wide alluvial valley or gently rolling agricultural lands.

The entire drainage area may still be considered densely forested. The portions of the basin that contribute most to the flow of the streams are almost entirely within the boundaries of national forests, and privately owned timber lands extend from the boundaries

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of the national forests to the main stream in the valley, except where lands have been cleared.

Although records of precipitation at the summit of the Coast Range are meager, it is likely that the total annual rainfall is as much as 150 inches. On the eastern slope of the Coast Range the annual precipitation decreases very rapidly to about 40 inches, but it gradually increases again until at the summit of the Cascade Range it is approximately 100 inches. From north to south the same general variation is observed, although the differences are not so striking. At the mouth of the river the precipitation is approximately 50 inches, in the vicinity of Corvallis about 40 inches, and at the summit of the Callapooya Mountains, which form the southern boundary of the drainage area, 55 or 60 inches. Except on the summits of the mountain ranges this precipitation is almost entirely rain, 95 per cent falling during nine months, from September to May. On the mountain ranges part of the precipitation is snow, and the country is subject during the spring and fall to warm chinook winds, accompanied by rather sudden melting of these snows, which frequently cause considerable damage from floods. During the growing season, when the precipitation rarely exceeds 2 inches, the valley is practically arid. Although irrigation has not long been practiced in the valley, it is likely that before many years a large part of the agricultural bottom lands will be placed under irrigation. Small ditches and pumping plants have been constructed, and the returns from irrigated agricultural lands show an increase of 50 to 500 per cent in production over the nonirrigated lands.

Lying almost wholly within a narrow strip adjacent to the main divide of the Cascades, where the soil and underlying rock is porous, similar to that in the basin of Deschutes River, on the east side of the range, are a number of lakes and marshes which afford favorable sites for storage reservoirs. As a result the streams flowing through the lakes and marshes experience no pronounced floods and are characterized by a large low-water flow. The effect of reservoirs on the Willamette would not be so marked as on more flashy streams, but their operation would greatly enhance the value of the river for irrigation, power, and navigation.

The highest known flood in the Willamette Valley occurred December, 1861, when the discharge at Albany was 220,000 cubic feet per second. The highest gage reading at Portland since that date was in 1894 but was due to backwater from Columbia River. The years 1899 and 1907 were "wet years." The year 1905 was a comparatively dry year. The longest record of stream flow in this basin has been obtained by applying recent measurements made at Albany to records obtained by the United States Weather Bureau since 1895.

The results of profile surveys in the Willamette River basin are set forth in Plates I to III (at end of volume).

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GAGING STATIONS.

The Survey has maintained in the basin of the Willamette the gaging stations shown by the following list. The stations are arranged in downstream order, the main stem of the river being determined by measuring or estimating its drainage area—that is, the headwater stream draining the largest area is considered the continuation of the main stream, and all stations from source to mouth are presented first; stations on the tributaries, in regular order from source to mouth, follow. Relations of the tributaries are indicated by indention. A dash following a date indicates that the station was being maintained June 30, 1913. A period after a date indicates discontinuance.

Willamette River, Middle Fork (head of Willamette River), near Hazeldell, Oreg., 1911–
Willamette River, Middle Fork, at Jasper, Oreg., 1905–
Willamette River near Springfield, Oreg., 1911–
Willamette River at Eugene, Oreg., 1911.
Willamette River at Albany, Oreg., 1895–
Willamette River at Salem, Oreg., 1910–
Willamette River at Oregon City, Oreg., 1909–
  Kelsey River near Hazeldell, Oreg., 1909.
  Willamette River, North Fork of Middle Fork, near Hazeldell, Oreg., 1909–
  Fall Creek near Fall Creek, Oreg., 1912–
  Willamette River, Coast Fork, near Goshen, Oreg., 1905–
    Willamette River, East Fork of Coast Fork:
      Row River near Disston, Oreg., 1910–
  McKenzie River at outlet of Clear Lake, Oreg., 1911.
  McKenzie River at McKenzie Bridge, Oreg., 1910–
  McKenzie River near Springfield, Oreg., 1905–
    Lost Creek near McKenzie Bridge, Oreg., 1911–
    Horse Creek near McKenzie Bridge, Oreg., 1911–
  Eugene power canal near Eugene, Oreg., 1911–
  Santiam River, North Fork (head of Santiam River), at Detroit, Oreg., 1907–1910.
  Santiam River, North Fork, at Mehama, Oreg., 1905–
  Santiam River, North Fork, near Hoover, Oreg., 1911–
  Santiam River, North Fork, at Niagara, Oreg., 1911–
  Santiam River at Jefferson, Oreg., 1905–
    Santiam River, Marion Fork, at Marion Lake, near Hoover, Oreg., 1907–
    Puzzle Creek, North Fork, near Hoover, Oreg., 1910–
    Puzzle Creek, South Fork, near Hoover, Oreg., 1910–
    Permelia Creek near Detroit, Oreg., 1907–1910.
    Whitewater Creek near Detroit, Oreg., 1907.
    Breitenbush Creek near Detroit, Oreg., 1910–
    Santiam River, South Fork, at Cascadia, Oreg., 1910–
    Santiam River, South Fork, at Waterloo, Oreg., 1905–
    Santiam River, South Fork, near Foster, Oreg., 1912–
      Santiam River, Middle Fork, near Foster, Oreg., 1912–
  Luckiamute River near Suver, Oreg., 1905–1910.
  Yamhill River, South Fork, at Sheridan, Oreg., 1906–1910.

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Willamette River at Oregon City, Oreg.—Continued.
Yamhill River at LaFayette, Oreg., 1908–
Molalla River near Molalla, Oreg., 1905–1909.
Clackamas River near Cazadero, Oreg., 1909–10.
Evaporation station near Cazadero, Oreg., 1911–
Clackamas River at Estacada, Oreg., 1908–1910.
Clackamas River at Park Place, Oreg., 1912–
Clackamas River near Barton, Oreg., 1905–1908.

PUBLICATIONS.

Information concerning stream flow at the stations listed in the preceding table has been published by the Survey in Water-Supply Papers 178, 214, 252, 272, 292, 312, 332,[1] and 362.[1]

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

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Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., Federal Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., Federal Building.
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A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

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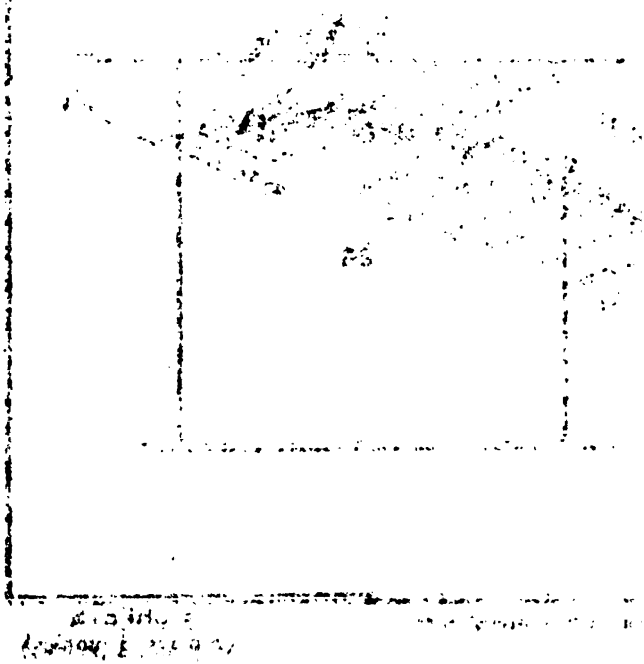

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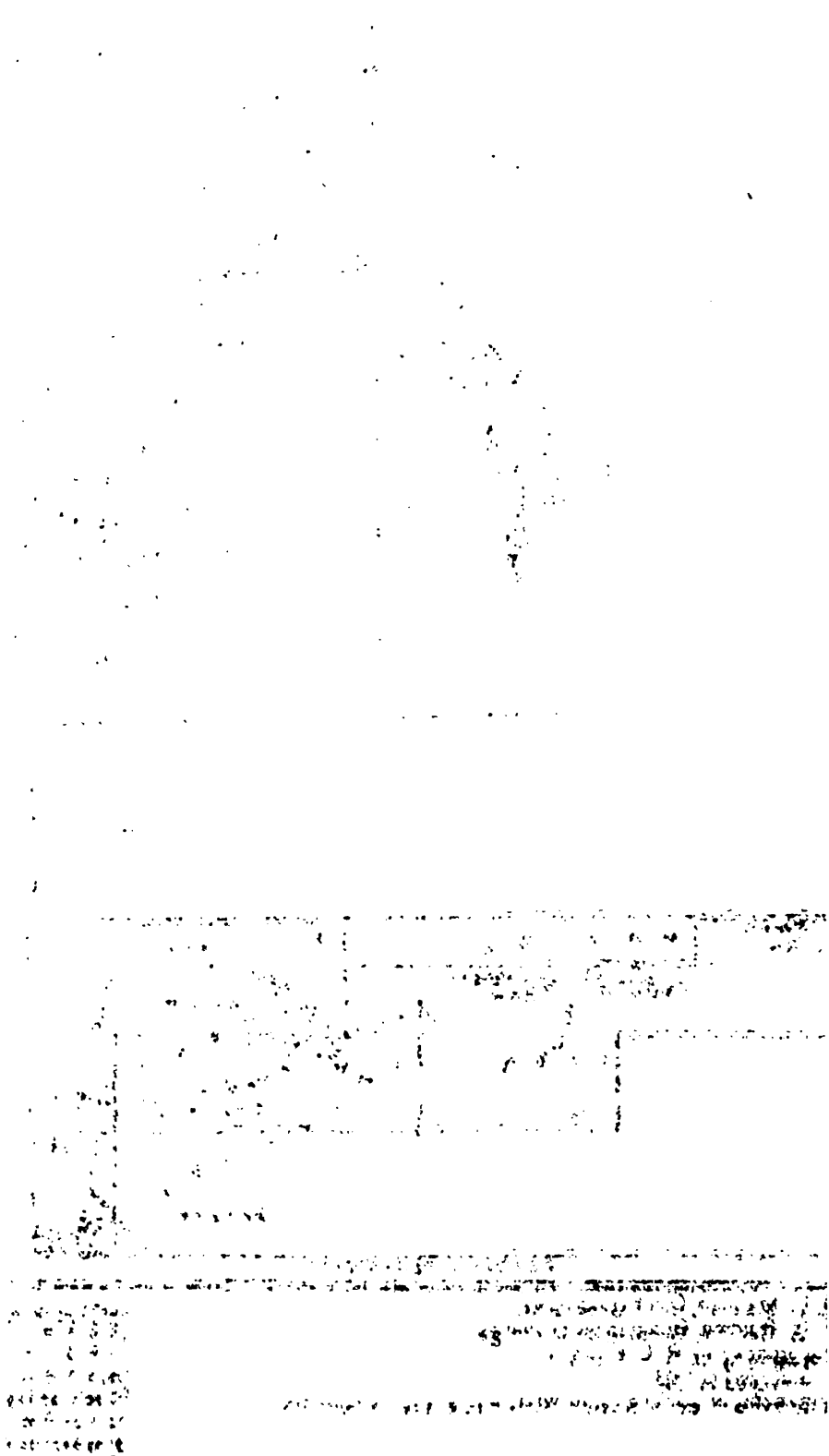

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A.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 350

PROFILE SURVEYS
IN
BEAR RIVER BASIN, IDAHO

PREPARED UNDER THE DIRECTION OF
R. B. MARSHALL, CHIEF GEOGRAPHER

WASHINGTON
GOVERNMENT PRINTING OFFICE
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ILLUSTRATIONS.

PLATE I. *A–F*, Plan and profile of Bear River from Riverdale to Novena, Idaho ..... At end of volume.

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PROFILE SURVEYS IN BEAR RIVER BASIN, IDAHO.

Prepared under the direction of R. B. MARSHALL, Chief Geographer.

GENERAL FEATURES OF BEAR RIVER BASIN.

Bear River rises on the northern slope of the Uinta Mountains, in the northeastern part of Utah, and after a circuitous course—in which it leaves Utah and enters Wyoming, Utah, and Wyoming in turn and makes a long detour in Idaho—it returns to Utah and finally discharges its waters into Great Salt Lake. The maximum elevation of the upper rim of the basin is 13,000 feet above sea level.

The upper part of the basin comprises a rough, broken country, well drained by numerous short streams, most of which are confined to steep, narrow canyons. The streams are fed by many small springs and by the melting of the snow which forms the greater part of the precipitation. The rocks of the extreme headwater region are chiefly sandstones and quartzites and are covered with a thin layer of soil that supports scattered groves of fir and aspen. A few small lakes lie near the head of the river.

Just below Dingle the main stream passes through the north end of Bear Lake Valley in a well-defined channel, and from this point to Preston it occupies a steep-walled canyon, broken here and there by short, narrow valleys containing irrigated farms. The tributaries in this stretch are few, the largest being Mink and Cottonwood creeks. About 10 miles below Dingle the river receives the outlet of Bear Lake, a small, crooked, sluggish stream that discharges but little water at any time, though it is the only visible outlet of a water body about 144 square miles in area. There is no storage on the main stream, but on Mink Creek a number of small storage reservoirs are contemplated or in process of construction, the water to be diverted for the irrigation of lands in the northwest end of Cache Valley.

Between Preston and the lower end of Cache Valley the Bear flows sluggishly along the west side of its basin in a well-defined channel, and during extreme floods it overflows slightly and covers a very narrow strip immediately along the river. The principal tributaries in this stretch are Cub Creek and Logan River.

Cub Creek rises in the Bear River Range and flows through a steep, narrow canyon in a rough limestone country until it reaches

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Cache Valley, which it crosses in a winding but well-defined channel to its junction with the Bear.

Logan River rises on the west slope of the Bear River Range, flows southwest and then northwest, and unites with the Bear near Benson, Utah. Its basin is rough and rugged, elevations ranging from 4,500 to 9,000 feet above sea level, and the river is confined largely to a steep, rough channel in a comparatively narrow canyon. Probably three-fourths of the precipitation in this basin is snow, the melting of which supplies the principal part of the spring and summer flow; the late summer and winter flow is derived chiefly from springs, which are well distributed over the basin. In its upper course the Logan receives many short, swift tributaries. Temple Fork and South Fork, which enter, respectively, 10 miles and 15 miles above Logan, are perennial streams and furnish one-third to one-fourth of the total flow. Blacksmith Fork comes in below Logan. The entire flow of this river, after being used to develop power at two electric plants near the mouth of the canyon, is diverted for irrigation. None of the run-off is stored at present.

Practically the only inflow to the Bear in Cache Valley is from seepage and springs. The lower portions of the valley form an artesian basin containing numerous small flowing wells. The water table lies very near the surface, and during the early part of the spring the lower lands are largely swamps.

The Bear River Canal Co. diverts practically the entire summer flow of the stream above Collinston to agricultural lands lying on both sides of the river below Bear River Canyon. This system has a capacity of 1,000 second-feet, and during the winter and flood seasons a part of the water is used to develop electric power at a point about a quarter of a mile above the Collinston station and is returned to the river at Collinston. From 10 to 30 second-feet reaches the stream through leaks and as seepage from the diversion canals.

Owing to the complete control of the stream by irrigation works, the discharge is liable to extreme variation at any period.

GAGING STATIONS.

The Survey has maintained on Bear River and tributaries above the mouth of Logan River the gaging stations shown by the following list. The stations are arranged in downstream order. All stations on the main stream from source to mouth are presented first; stations on the tributaries, in regular order from source to mouth, follow. Relations of tributaries are indicated by indention. A dash following a date indicates that the station was being maintained June 30, 1913. A period after a date indicates discontinuance.

Bear River at Dingle, Idaho, 1903–
Bear (Mud) Lake Inlet canal near Dingle, Idaho, 1911–
Bear River at Alexander, Idaho, 1911–
Bear River near Preston, Idaho, 1889–

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Bear River near Collinston, Utah, 1889–
Bear River at Fishhaven, Idaho, 1904–1906.
Cub Creek near Franklin, Idaho, 1900–1901.
Georgetown Creek near Georgetown, Idaho, 1911–
West Side canal near Collinston, Utah, 1912.
Hammond ditch near Collinston, Utah, 1912.

PUBLICATIONS.

Information concerning stream flow at the stations listed in the preceding table has been published by the Survey in the following reports:

Annual Reports: Eleventh, pt. 2; twelfth, pt. 2; thirteenth, pt. 3; fourteenth, pt. 2; sixteenth, pt. 2; eighteenth, pt. 4; nineteenth, pt. 4; twentieth, pt. 4; twenty-first, pt. 4; twenty-second, pt. 4.
Bulletins: 131, 140.
Water-Supply Papers: 11, 16, 28, 38, 51, 66, 75, 85, 100, 133, 176, 212, 250, 270, 290, 310, 330, 360.[1]

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C., but the edition printed for free distribution is small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will on application furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
St. Paul, Minn., Old Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., Federal Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., Federal Building.
Santa Fe., N. Mex., Capitol Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

[1] In preparation.

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FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

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WATER-SUPPLY PAPER 351

SURFACE WATER SUPPLY OF THE UNITED STATES

1913

PART I. NORTH ATLANTIC COAST BASINS

NATHAN C. GROVER, Chief Hydraulic Engineer

C. C. COVERT and G. C. STEVENS, District Engineers

Prepared in cooperation with the States of Maine, Vermont, Massachusetts, and New York

WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

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SURFACE WATER SUPPLY OF THE NORTH ATLANTIC COAST BASINS FOR 1913.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of twelve reports presenting results of measurements of flow made on streams in the United States during 1913. Six of these reports contain data for the year ending September 30, and the other six for the calendar year, as indicated in the table on page 8.

The data presented in these reports were collected by the United States Geological Survey under authority implied in the organic law (20 Stat. L., p. 394) which contains the following paragraph:

Provided, That this officer [the Director] shall have the direction of the geological survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies of water supply for irrigation. Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1914.

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1914, inclusive	150,000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected, and of the second kind on page 17.

Measurements of stream flow have been made at about 3,000 points in the United States, and also at many points in small areas in

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Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. In July, 1913, about 1,380 gaging stations were being maintained by the Survey and the cooperating organizations, and many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in the regular water-supply papers from time to time.

PUBLICATIONS.

A report has been prepared for each year embodying the stream-flow data collected during that year. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119. Circulars are also available giving complete lists of the gaging stations maintained by the Survey to date, and a list of the reports relating to the water supply of the country.

Prior to 1901 gage heights and discharge measurements were published in water-supply papers or bulletins and estimates of monthly discharge in annual reports; since 1901 both classes of data have been published in water-supply papers, and they are now being published in twelve parts, as shown in the following table:

Papers on surface water supply of the United States, 1913.

Part.	No.	Title.	Year used.
I	351	North Atlantic basins	Calendar year.
II	352	South Atlantic and eastern Gulf of Mexico basins	Do.
III	353	Ohio River basin	Year ending Sept. 30.
IV	354	St. Lawrence River basin	Calendar year.
V	355	Upper Mississippi River and Hudson Bay basins	Year ending Sept. 30.
VI	356	Missouri River basin	Calendar year.
VII	357	Lower Mississippi River basin	Do.
VIII	358	Western Gulf of Mexico basins	Year ending Sept. 30.
IX	359	Colorado River basin	Calendar year.
X	360	Great Basin	Year ending Sept. 30.
XI	361	Pacific basins in California	Do.
XII	362	North Pacific basins	Do.

A list of reports containing stream-flow data is presented in the following table:

Stream-flow data in reports of the United States Geological Survey.

[A = Annual Report; B = Bulletin; WS = Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884 to Sept., 1890.
12th A, pt. 2	....do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.

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Stream-flow data in reports of the United States Geological Survey—Continued.

Report.	Character of data.	Year.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, for eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 16	Descriptions, measurements, and gage heights, for western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, for eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, for Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
WS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	do	1906.
WS 241 to 252	do	1907–8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.
WS 321 to 332	do	1912.
WS 351 to 362	do	1913.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The table on page 10 gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1913. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data from 1902 to 1913 for any station in the area covered by Part III are published in Water-Supply Papers 83, 98, 128, 169, 205, 243, 263, 283, 303, 323, and 353, which contain records for the Ohio River basin for those years. The year covered by the report is indicated at the head of the column in which the paper is listed.

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Numbers of water-supply papers containing results of stream measurements, 1899–1913.

	1899 [a]	1900 [b]	1901	1902	1903	1904	1905	1906	1907–8	1909	1910	1911	1912	1913
North Atlantic coast	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125 [f] 167	[d] 165, [e] 166 [f] 167	[d] 201, [e] 202 [f] 203	241	261	281	301	321	351
South Atlantic coast and eastern Gulf of Mexico	[g] 35 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127	[f] 167, 168	[f] 203, 204	242	262	282	302	322	352
Ohio River basin	36	48, [h] 49	65, 75	83	98	128	169	205	243	263	283	303	323	353
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129	170	206	244	264	284	304	324	354
Hudson Bay and Upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, [k] 160	[j] 128, 130	171	207	245	265	285	305	325	355
Missouri River	[l] 36, 37	49, [m] 50	66, 75	84	99	130, [n] 131	172	208	246	266	286	306	326	356
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131	[j] 169, 173	[j] 205, 209	247	267	287	307	327	357
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288	308	328	358
Colorado River	[o] 37, 38	50	66, 75	85	100	133	175, [p] 177	211	249	269	289	309	329	359
Great Basin	38, [q] 39	51	66, 75	85	100	133, [r] 134	176, [r] 177	212, [r] 213	250, [r] 251	270, [r] 271	290, [r] 291	310	330	360
California	38, [s] 39	51	66, 75	85	100	134	177	213	251	271	291	311	331	361
North Pacific coast	38	51	66, 75	85	100	135	[t] 177, 178	214	252	272	292	312	[u] 332	[u] 362

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.

[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.

[c] Wissahickon and Schuylkill rivers to James River.

[d] New England rivers only.

[e] Hudson River to Delaware River, inclusive.

[f] Susquehanna River to Yadkin River, inclusive.

[g] James River only.

[h] Scioto River.

[i] Lake Ontario and tributaries to St. Lawrence River proper.

[j] Tributaries of Mississippi from east.

[k] Hudson Bay only.

[l] Gallatin River.

[m] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.

[n] Platte and Kansas rivers.

[o] Green and Gunnison rivers and Grand River above junction with Gunnison.

[p] Below junction with Gila.

[q] Mohave River only.

[r] Great Basin in California, excepting Truckee and Carson drainage basins.

[s] Kings and Kern rivers only.

[t] Rogue, Umpqua, and Siletz rivers only.

[u] In the three parts: *A*, Pacific basins in Washington and Upper Columbia River; *B*, Snake River; *C*, Lower Columbia River and Rougue, Umpqua, and Siletz rivers.

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Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Phoenix, Ariz., Fleming Building.
Austin, Tex., Old Post Office Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Tacoma, Wash., Federal Building.
Portland, Oreg., 416 Couch Building.
San Francisco, Cal., 328 Customhouse.
Los Angeles, Cal., Federal Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those which represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those which represent the actual quantity of water, as run-off (depth in inches), acre-feet, and millions of cubic feet. The units used in this series of reports are second-foot, second-feet per square mile, run-off in inches, acre-foot, and millions of cubic feet. They may be defined as follows:

"Second-foot" is an abbreviation for "cubic foot per second" and is a unit for the rate of discharge of water flowing in a stream. A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average

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velocity of 1 foot a second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the tables of convenient equivalents (pp. 12–14).

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off (depth in inches)" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot" is equivalent to 43,560 cubic feet, and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

"Millions of cubic feet" is used to express quantities of water stored in reservoirs, most frequently in studies of flood control.

The following terms used in these reports are not in common use, and may be defined as follows:

"Discharge relation," is an abbreviation for the term "relation of gage height to discharge."

"Control," "controlling section," and "point of control" are terms used to designate the section or sections of the stream below the gage which determines the discharge relation at the gage. It should be noted that the control may not be the same section at all stages.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—to which the surface of the river would fall if there were no flow.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.03719	1.041	1.079	1.116	1.153
2.....	.07438	2.083	2.157	2.231	2.306
3.....	.11157	3.124	3.236	3.347	3.459
4.....	.14876	4.165	4.314	4.463	4.612
5.....	.18595	5.207	5.393	5.578	5.764
6.....	.22314	6.248	6.471	6.694	6.917
7.....	.26033	7.289	7.550	7.810	8.070
8.....	.29752	8.331	8.628	8.926	9.223
9.....	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the values for one day by the number of days.

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Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1.983	55.54	57.52	59.50	61.49
2	3.967	111.1	115.0	119.0	123.0
3	5.950	166.6	172.6	178.5	184.5
4	7.934	222.1	230.1	238.0	246.0
5	9.917	277.7	287.6	297.5	307.4
6	11.90	333.2	345.1	357.0	368.9
7	13.88	388.8	402.6	416.5	430.4
8	15.87	444.3	460.2	476.0	491.9
9	17.85	499.8	517.7	535.5	553.4

NOTE.—For part of a month multiply values for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge in second-feet.	Run-off in millions of cubic feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.0864	2.419	2.506	2.592	2.678
2	.1728	4.838	5.012	5.184	5.356
3	.2592	7.257	7.518	7.776	8.034
4	.3456	9.676	10.024	10.368	10.712
5	.4320	12.095	12.530	12.960	13.390
6	.5184	14.514	15.036	15.552	16.068
7	.6048	16.933	17.542	18.144	18.746
8	.6912	19.352	20.048	20.736	21.424
9	.7776	21.771	22.554	23.328	24.102

NOTE.—For part of a month multiply values for one day by the number of days.

1 second-foot equals 40 California miner's inches (law of Mar. 23, 1901).

1 second-foot equals 38.4 Colorado miner's inches.

1 second-foot equals 40 Arizona miner's inches.

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year (365 days) covers 1 square mile 1.131 feet, or 13.572 inches deep.

1 second-foot for one year (365 days) equals 31,536,000 cubic feet.

1 second-foot for one-year (365 days) equals 724 acre-feet.

1 second-foot equals about 1 acre-inch per hour.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

100 California miner's inches equals 18.7 United States gallons per second.

100 California miner's inches for one day equals 4.96 acre-feet.

100 Colorado miner's inches equals 2.60 second-feet.

100 Colorado miner's inches equals 19.5 United States gallons per second.

100 Colorado miner's inches for one day equals 5.17 acre-feet.

100 United States gallons per minute equals 0.223 second-foot.

100 United States gallons per minute for one day equals 0.442 acre-foot.

1,000,000 United States gallons per day equals 1.55 second-feet.

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1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals to 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1½ horsepower equal about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

For each regular gaging station the following data, so far as available, are given: Description of the station, list of discharge measurements, table of daily gage heights, table of daily discharge, table of yearly and monthly discharge and run-off. For stations located at weirs or dams the gage-height table is usually omitted.

In addition to statements regarding the location and equipment of gaging stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such points as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The table of daily gage heights shows the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening, though at many stations only one reading is made each day. At a comparatively few stations automatic gages are used, some of which give a continuous record of the river stage in the form of a hydrograph and others a record printed at regular intervals, from which the mean daily gage height can be computed. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams or by backwater from obstructions are published as recorded, with

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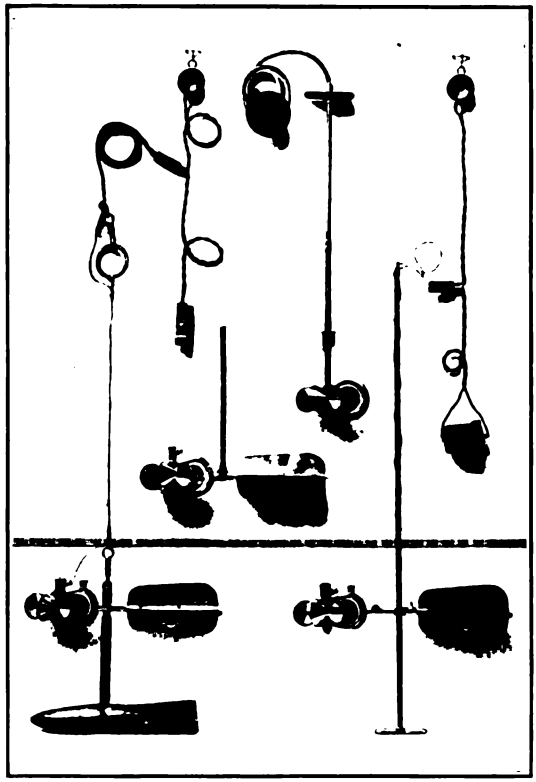
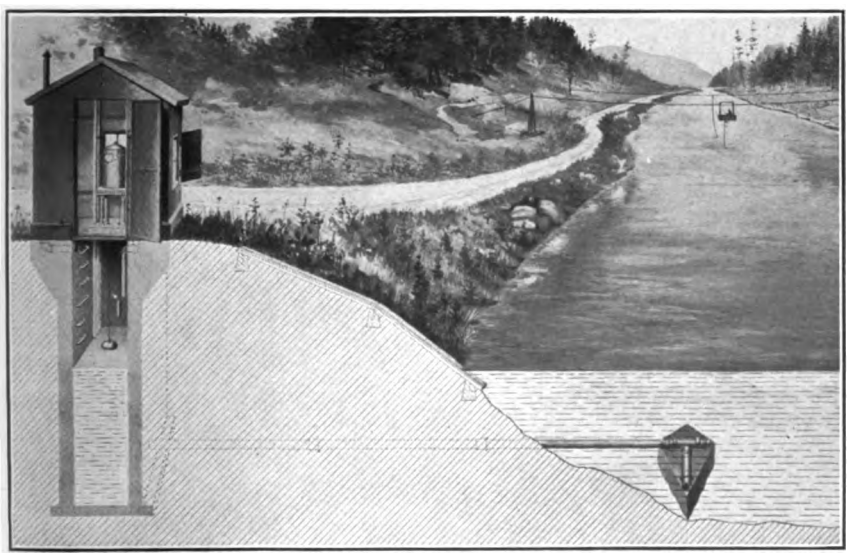


A. PRICE CURRENT METERS.



B. TYPICAL GAGING STATIONS.

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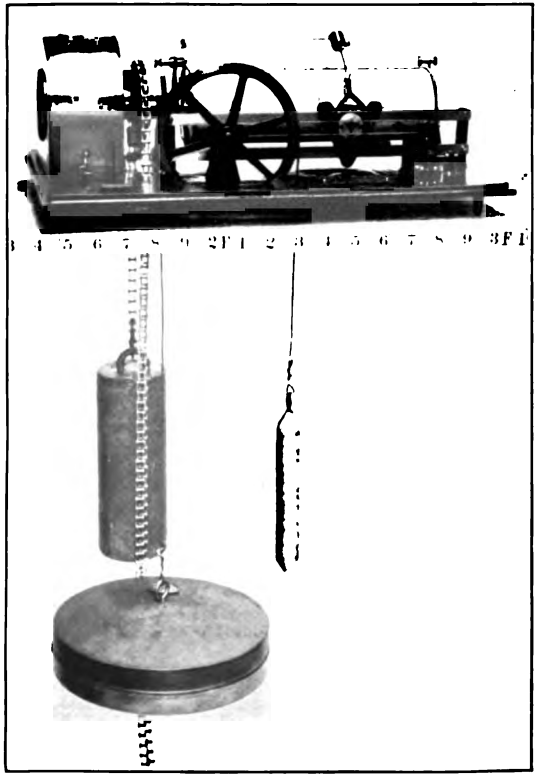
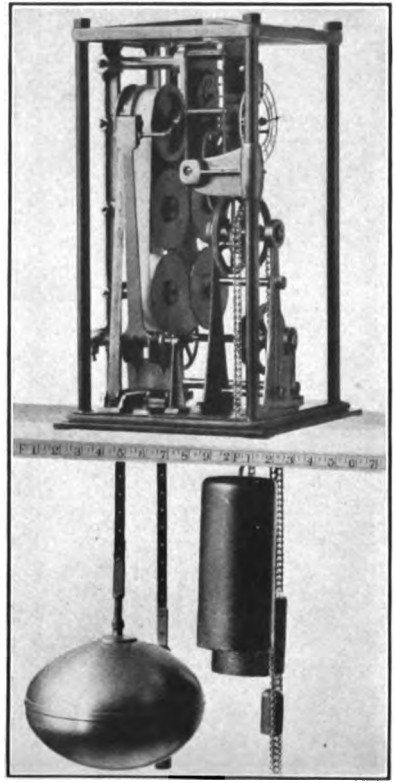
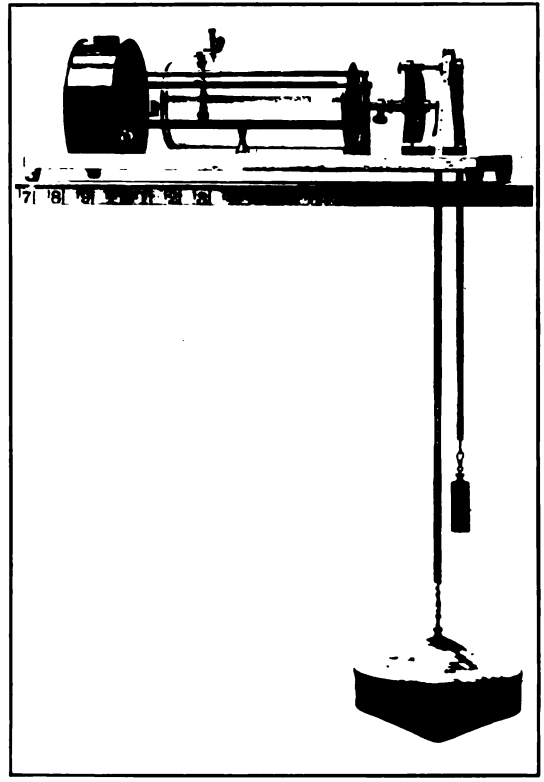


A. STEVENS.



B. GURLEY.



C. FRIEZ.

AUTOMATIC GAGES.

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suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum, in general somewhat below the lowest known flow, so that negative readings shall not occur.

In the tables of daily gage height the use of zeros in the hundredths place indicates the limits of accuracy to which the gage was read and to which the mean daily gage height was computed. If a gage is read to tenths or half-tenths once a day or to tenths twice a day, no zeros appear in the hundredths place for any stage. If the gage is read to half tenths twice a day or to quarter tenths or hundredths, regardless of the number of readings a day, the gage heights are published to hundredths, and zeros appear in the hundredths place, below a certain limiting stage. This limiting stage is so selected that the average error in the mean daily discharge, resulting from not using the mean daily gage height to hundredths above that stage, shall not be greater than 2 per cent. For automatic gages the allowable average error of the daily discharge has been taken as 1 per cent. The selection of the percentage is arbitrary, but it should be noted that the maximum error will in all cases be twice the average error. In like manner half tenths are used from the hundredths limit to another higher limit, above which only tenths are used. It is the aim to have the gage-height observations at each gaging station recorded to the degree of refinement required by the above method of use, but in practice it is found necessary, in order to avoid confusion in the gage observer's record, to have the observations for all stages recorded to the degree of refinement required for low stages, which usually necessitates readings to hundredths of a foot.

The discharge measurements and gage heights are the base data from which rating tables, daily discharge tables, and monthly discharge tables are computed.

The base data presented in this report, unless otherwise stated in the descriptions of stations, have been collected by the methods commonly used at current-meter gaging stations and described in standard textbooks. (See Pls. I and II.)

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report, but can be determined from the tables of daily gage heights and daily discharge by plotting gage heights in feet as ordinates and discharge in second-feet as abscissas.

The table of daily discharge determined from the gage height and rating tables gives the discharge in second-feet corresponding to the mean of the gage readings observed each day.

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In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on page 12, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends (1) on the permanence of the relation between discharge and stage, and (2) on the accuracy of observation of stage, measurements of discharge, and interpretation of data.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables, "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and knowledge of local conditions. In this column, A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors, which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use. On this account the computations of "second-feet per square mile" and "run-off (depth in inches)" have not been made for stations draining areas having an annual rainfall of less than 20

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inches, nor for those stations draining areas of over 20 inches of rainfall for which it is believed that the computations would be uncertain and misleading because of the presence of large noncontributing districts in the measured drainage area, of omitting estimates of water diverted for irrigation or other use, or of artificial control or unusual natural control of the flow of the river above the gaging station. All values of "second-feet per square mile" and "run-off (depth in inches)" previously published by the Survey should be used with extreme caution, and such values in this report should be used with care because of possible inherent sources of error not known to the Survey.

In general, the base data collected each year by the Survey engineers are published, not only to comply with the law, but also to afford any engineer the means of examining and adjusting to his own needs the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The determinations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined.

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published, and the engineer who makes use of the figures presented in these papers should verify all ratings and make such adjustments for earlier years as may seem necessary.

COOPERATION.

The hydrometric work in Maine was carried on in cooperation with the Maine State Water Storage Commission, William T. Haines, governor, chairman, and Cyrus C. Babb, chief engineer.

Hydrometric work in Vermont and Massachusetts was carried on under a cooperative agreement between the governors of the States and the director of the United States Geological Survey.

In New York hydrometric work was carried on in cooperation with the State Conservation Commission and also with the State engineer and surveyor.

Financial assistance has been rendered by the Connecticut River Transmission Co., the Turners Falls Co., the Holyoke Water Power Co., the Adirondack Electric Power Corporation, the International Paper Co., the Union Bag & Paper Co., the Finch, Pruyn Paper Co., the Spottsylvania Power Co., the Potomac Electric Power Co., and other power companies in connection with records on streams which they are utilizing.

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DIVISION OF WORK.

The field data for stations in Maine were collected by Cyrus C. Babb, chief engineer, Maine State Water Storage Commission, and G. C. Danforth, assistant engineer, who also prepared the ratings and made the computations and special studies for those stations.

The field data for New York and New England, outside of Maine, were collected under the direction of C. C. Covert, district engineer, by C. H. Pierce, O. W. Hartwell, C. S. De Golyer, G. H. Canfield, G. J. Lyon, J. G. Mathers, Frank Weber, W. S. Easterly, and R. S. Barnes. The ratings and studies of completed data were made by O. W. Hartwell and C. H. Pierce. The computations and ice estimates were made by O. W. Hartwell and C. H. Pierce, assisted by C. S. De Golyer, Frank Weber, W. S. Easterly, H. W. Fear, W. A. James, and M. J. Maguire.

The field data for the Middle Atlantic States were collected under the direction of G. C. Stevens by J. G. Mathers, H. D. Padgett, M. I. Walters, and C. L. Batchelder. The ratings and studies of completed data were made by G. C. Stevens. The computations and ice estimates were made under the direction of G. C. Stevens by J. G. Mathers, H. D. Padgett, M. I. Walters, and C. L. Batchelder.

The complete manuscript was prepared for publication by E. S. Fuller and edited by Mrs. B. D. Wood.

GAGING-STATION RECORDS.

ST. JOHN RIVER BASIN.

ST. JOHN RIVER AT FORT KENT, MAINE.

Location.—At the suspension footbridge in the town of Fort Kent, a short distance above the mouth of Fish River and about 15 miles below the mouth of St. Francis River.

Records available.—October 13, 1905, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—4,880 square miles.

Gage.—Inclined staff, 22 feet long, in two sections, attached to the new concrete pier nearest the New Brunswick shore of the river. The lower part of the gage is placed in a groove in the side of the pier; the upper part is fastened to the downstream end of the same pier.

Channel and control.—Practically permanent; both banks high, rocky, cleared, and not subject to overflow except in extreme freshets.

Discharge measurements.—Made from footbridge. No measurements since 1911.

Winter flow.—Affected by ice.

Regulation.—A few dams on the upper headwaters are used for log driving; the operation of these dams only slightly affects the flow past the gage.

Accuracy.—Discharge relation occasionally affected by backwater caused by logs jamming on the bridge piers and, during the winter, by ice.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

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Daily gage height, in feet, of St. John River at Fort Kent, Maine, for 1913.

[A. V. Currie, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.2	.....	.....	9.95	18.4	9.4	4.5	4.3	3.5	3.65	6.4	5.3
2	5.25	.....	.....	10.1	16.4	9.1	5.3	4.3	3.4	3.45	5.7	5.3
3	5.3	.....	.....	10.55	13.45	9.15	5.55	4.4	3.3	3.4	5.25	5.4
4	5.2	6.6	5.7	10.35	11.95	9.45	5.75	4.3	3.2	3.55	5.1	5.45
5	.....	.....	.....	9.8	11.3	8.65	5.8	4.25	3.15	3.6	5.0	5.5
6	.....	.....	.....	9.55	11.15	8.05	5.7	4.2	3.1	3.55	4.95	5.6
7	.....	.....	.....	9.25	11.05	7.9	5.55	4.0	3.1	3.5	4.9	5.6
8	.....	.....	.....	8.55	10.65	7.85	4.7	3.9	3.0	3.5	4.7	5.5
9	.....	.....	.....	8.1	9.85	7.7	4.3	3.8	2.9	3.4	4.7	5.5
10	.....	.....	.....	7.85	8.9	7.5	4.3	3.8	2.85	3.4	4.6	5.4
11	.....	6.4	5.7	7.65	8.4	6.85	4.55	3.8	2.75	3.4	4.55	5.3
12	.....	.....	.....	7.45	7.95	6.4	5.25	3.7	2.55	3.4	4.5	5.15
13	6.0	.....	.....	7.25	7.5	6.05	5.75	3.6	2.55	3.4	4.65	4.95
14	.....	.....	.....	7.3	7.1	5.85	5.8	3.6	2.75	3.5	4.65	4.75
15	.....	.....	.....	7.55	6.85	5.7	5.75	3.5	2.9	3.65	4.6	4.6
16	.....	.....	.....	7.85	6.6	5.65	5.55	3.5	3.0	3.75	4.6	4.5
17	.....	.....	.....	8.65	6.35	5.6	5.7	3.5	3.0	3.9	4.55	4.45
18	.....	6.0	6.6	9.5	6.25	5.6	6.15	3.4	3.0	4.1	4.5	4.3
19	.....	.....	.....	10.5	6.2	5.75	6.45	3.35	3.0	4.45	4.4	4.15
20	8.1	.....	.....	11.1	6.35	5.85	6.9	3.25	3.1	4.55	4.5	4.1
21	.....	.....	.....	11.25	6.5	5.5	6.7	3.2	3.1	6.1	5.15	4.1
22	.....	.....	.....	11.0	6.5	5.15	6.1	3.1	3.15	7.2	5.65	4.1
23	.....	.....	.....	10.6	7.2	5.05	5.7	3.1	3.4	7.45	5.9	4.0
24	.....	.....	.....	12.35	7.75	4.95	5.35	3.1	3.65	6.85	6.4	.....
25	.....	5.8	11.6	15.1	7.8	4.8	5.3	3.1	4.3	6.4	6.6	.....
26	.....	.....	.....	16.7	7.8	4.65	5.1	3.1	4.95	6.05	6.55	.....
27	7.0	.....	.....	17.8	7.8	4.5	4.85	3.15	4.8	6.05	6.35	.....
28	.....	.....	.....	18.8	7.8	4.45	4.8	3.2	4.4	6.25	5.9	.....
29	.....	.....	.....	19.25	8.05	4.35	4.65	3.25	3.95	6.45	5.55	4.1
30	.....	.....	.....	19.4	9.1	4.3	4.55	3.4	3.8	6.6	5.4	.....
31	.....	.....	.....	.....	9.9	.....	4.45	3.5	.....	6.65	.....	.....

NOTE.—Discharge relation Jan. 5 to Mar. 31 seriously affected by ice.

Daily discharge, in second-feet, of St. John River at Fort Kent, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,470	.....	.....	24,700	75,000	22,000	3,610	3,140	1,660	1,890	9,400	5,770
2	5,620	.....	.....	25,400	61,700	20,700	5,770	3,140	1,520	1,590	7,010	5,770
3	5,770	.....	.....	27,600	43,400	20,900	6,540	3,370	1,390	1,520	5,620	6,070
4	5,470	.....	.....	26,600	34,900	22,300	7,170	3,140	1,270	1,740	5,180	6,220
5	.....	.....	.....	23,900	31,500	18,600	7,330	3,030	1,220	1,810	4,900	6,380
6	.....	.....	.....	22,800	30,700	16,000	7,010	2,920	1,160	1,740	4,760	6,690
7	.....	.....	.....	21,400	30,200	15,400	6,540	2,510	1,160	1,660	4,630	6,690
8	.....	.....	.....	18,200	28,100	15,200	4,110	2,320	1,060	1,660	4,110	6,380
9	.....	.....	.....	16,200	24,200	14,500	3,140	2,140	960	1,520	4,110	6,380
10	.....	.....	.....	15,200	19,800	13,700	3,140	2,140	915	1,520	3,860	6,070
11	.....	.....	.....	14,300	17,500	11,100	3,740	2,140	825	1,520	3,740	5,770
12	.....	.....	.....	13,500	15,600	9,400	5,620	1,970	660	1,520	3,610	5,320
13	.....	.....	.....	12,700	13,700	8,170	7,170	1,819	660	1,520	3,980	4,760
14	.....	.....	.....	12,900	12,100	7,500	7,330	1,810	825	1,660	3,980	4,240
15	.....	.....	.....	13,900	11,100	7,010	7,170	1,660	960	1,890	3,860	3,860
16	.....	.....	.....	15,200	10,100	6,850	6,540	1,660	1,060	2,060	3,860	3,610
17	.....	.....	.....	18,600	9,220	6,690	7,010	1,660	1,060	2,320	3,740	3,490
18	.....	.....	.....	22,500	8,860	6,690	8,520	1,520	1,060	2,710	3,610	3,140
19	.....	.....	.....	27,400	8,690	7,170	9,580	1,460	1,060	3,490	3,370	2,820
20	.....	.....	.....	30,400	9,220	7,500	11,300	1,330	1,160	3,740	3,610	2,710
21	.....	.....	.....	31,200	9,770	6,380	10,500	1,270	1,160	8,340	5,320	2,710
22	.....	.....	.....	29,900	9,770	5,320	8,340	1,160	1,220	12,500	6,850	2,710
23	.....	.....	.....	27,900	12,500	5,040	7,010	1,160	1,520	13,500	7,660	2,510
24	.....	.....	.....	37,100	14,700	4,760	5,920	1,160	1,890	11,100	9,400	2,510
25	.....	.....	.....	53,400	15,000	4,370	5,770	1,160	3,140	9,400	10,100	2,510
26	.....	.....	.....	63,600	15,000	3,980	5,180	1,160	4,760	8,170	9,960	2,510
27	.....	.....	.....	71,000	15,000	3,610	4,500	1,220	4,370	8,170	9,220	2,510
28	.....	.....	.....	77,700	15,000	3,490	4,370	1,270	3,370	8,860	7,660	2,510
29	.....	.....	.....	80,800	16,000	3,260	3,980	1,330	2,420	9,580	6,540	2,710
30	.....	.....	.....	81,900	20,700	3,140	3,740	1,520	2,140	10,100	6,070	2,710
31	.....	.....	.....	.....	24,400	.....	3,490	1,660	.....	10,300	.....	2,710

NOTE.—Discharge determined from a fairly well defined rating curve. Mean discharge for January, February, and March estimated by comparison with records at Van Buren and subject to some uncertainty.

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Monthly discharge of St. John River at Fort Kent, Maine, for 1913.

[Drainage area, 4,880 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	.....	.....	5,100	1.04	1.20
February	.....	.....	2,900	.59	.61
March	.....	.....	6,400	1.31	1.51
April	31,900	12,700	31,900	6.54	7.30
May	75,000	8,690	21,400	4.38	5.05
June	22,300	3,140	10,000	2.05	2.29
July	11,300	3,140	6,170	1.26	1.45
August	3,370	1,160	1,900	.39	.45
September	4,760	660	1,590	.32	.36
October	13,500	1,520	4,810	.98	1.13
November	10,100	3,370	5,660	1.16	1.29
December	6,690	2,510	4,220	.86	.99
The year	81,900	660	8,500	1.74	23.63

ST. JOHN RIVER AT VAN BUREN, MAINE.

Location.—At new International Bridge at Van Buren, Maine, about 14 miles above Grand Falls, New Brunswick.

Records available.—May 4, 1908, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—8,270 square miles.

Gage.—Gage read since May 6, 1912, painted vertically on second pier from Van Buren side of bridge; zero of gage is 407.69 feet above sea level; daily gage heights for 1910 and 1911 were read on a vertical rod attached to the pier of the sawdust carrier of Hammond's mill, about 700 feet below the International Bridge, but as published they are reduced to the bridge datum.

Discharge measurements.—Made from the International Bridge.

Winter flow.—Affected by ice.

Regulation.—The little storage above for log driving probably does not affect the discharge.

Accuracy.—Results good. Winter estimates fair.

Cooperation.—Station established by the International Commission, River St. John, but maintained since May 6, 1912, by the Maine State Water Storage Commission.

The discharge measurements for 1913 furnished by H. S. Ferguson, consulting engineer, New York, N. Y.

Discharge measurements of St. John River at Van Buren, Maine, during 1913.

[Made by engineers in the employ of H. S. Ferguson, consulting engineer.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 23	14.50	43,100	May 27	10.20	26,300	June 27	4.90	8,900
25	15.80	50,100	31	13.15	38,600	30	4.50	8,400
26	18.75	70,600	June 3	12.50	34,700	July 8	4.00	7,000
28	26.00	113,000	7	11.70	31,500	Aug. 2	3.80	6,200
29	26.90	120,000	10	9.35	22,700	5	3.60	5,900
May 1	23.45	94,000	11	8.85	20,900	8	3.00	4,800
2	20.85	79,100	12	8.35	19,000	18	2.10	3,500
3	18.90	70,000	14	7.70	17,200	Sept 17	1.60	2,100
5	17.55	61,400	16	7.00	14,300	24	3.00	4,700
8	16.00	53,100	20	7.00	14,700	30	2.55	3,900
10	14.10	43,000	21	6.60	13,300	Oct. 2	2.10	3,000
12	12.35	35,000	21	6.60	13,800			
13	11.45	30,100	23	5.80	10,900			
16	9.80	24,500	25	5.40	10,200			

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Daily gage height, in feet, of St. John River at Van Buren, Maine, for 1913.

[W. H. Scott, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.0	6.25	4.1	16.9	23.7	13.0	4.5	4.1	2.15	2.35	6.40	6.00
2	6.0	6.05	4.1	16.7	21.2	21.45	4.75	3.75	2.3	2.18	6.00	5.80
3	5.9	5.75	4.1	17.05	19.15	12.5	4.55	3.55	2.15	2.10	5.50	5.20
4	6.15	5.45	4.1	17.3	18.1	12.85	5.65	3.5	2.0	2.20	5.15	4.50
5	6.35	5.3	4.1	17.45	17.55	12.7	5.6	3.5	1.95	2.10	4.95	4.00
6	6.0	5.15	4.1	16.85	17.2	12.25	5.1	3.45	1.85	1.95	4.75	4.50
7	6.0	5.0	4.1	16.2	16.9	11.6	4.5	3.25	1.7	2.20	4.58	6.10
8	5.9	4.9	4.1	.....	16.05	10.8	4.15	3.05	1.55	2.30	4.50	6.00
9	6.0	4.8	4.1	.....	15.0	10.0	3.85	2.85	1.7	2.15	4.50	6.00
10	6.0	4.7	4.1	.....	14.0	9.3	3.55	2.7	1.58	2.00	4.48	6.00
11	6.1	4.55	4.1	.....	13.2	8.75	3.7	2.75	1.45	2.02	4.68	6.00
12	6.0	4.4	4.1	13.4	12.35	8.25	4.35	2.9	1.40	1.98	4.62	6.00
13	5.95	4.3	4.1	13.1	11.6	7.9	4.85	2.8	1.40	1.90	4.70	6.00
14	5.65	4.2	4.1	13.15	10.8	7.6	5.7	2.7	1.35	2.00	4.68	.....
15	5.5	4.1	4.15	13.6	10.15	7.2	5.7	2.6	1.35	2.05	4.50	.....
16	5.5	4.1	4.5	14.6	9.7	7.0	5.65	2.45	1.68	2.10	4.35	.....
17	5.5	4.1	5.55	16.0	9.25	6.75	5.2	2.25	1.60	2.15	4.15	.....
18	5.6	4.1	5.35	15.6	8.9	6.9	5.0	2.1	1.60	2.38	3.95	.....
19	5.6	4.1	5.6	13.0	8.75	7.0	5.15	2.05	1.60	2.68	3.88	.....
20	5.6	4.1	6.1	13.9	9.05	6.9	7.1	1.95	1.58	3.12	4.10	.....
21	5.6	4.1	7.05	14.95	9.5	6.3	7.4	1.9	1.48	4.10	4.40	.....
22	5.65	4.1	10.2	15.0	9.3	6.0	6.6	1.9	1.40	5.60	4.40	.....
23	5.9	4.1	11.65	14.55	9.3	5.9	5.9	1.8	1.90	7.45	4.80	.....
24	6.05	4.1	11.65	14.45	9.8	5.7	5.3	1.8	3.02	7.42	5.70	.....
25	6.45	4.1	13.0	15.85	10.45	5.35	4.95	1.85	3.15	6.70	5.80	.....
26	6.7	4.1	13.85	19.3	10.3	5.05	4.7	2.05	3.38	6.40	5.82	.....
27	6.7	4.1	14.4	23.5	10.3	4.75	4.35	2.2	3.85	6.35	5.68	.....
28	6.7	4.1	15.2	26.3	10.3	4.6	4.1	2.25	3.25	6.85	5.75	.....
29	6.7	.....	15.2	26.8	10.15	4.5	4.25	2.4	2.88	7.05	5.92	4.30
30	6.55	.....	15.25	25.95	11.7	4.5	4.55	2.3	2.65	6.95	6.00	4.30
31	6.4	.....	15.65	.....	13.2	.....	4.5	2.25	.....	6.75	.....	4.25

NOTE.—Discharge relation Jan. 1 to Apr. 18 and Dec. 6 to Dec. 31 seriously affected by ice.

Daily discharge, in second-feet, of St. John River at Van Buren, Maine, for Dec. 1, 1912, to Dec. 31, 1913.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	15,500	6,440	7,250	2,520	34,200	102,000	36,900	8,110	7,220	3,100	3,490	13,000	7,540
2	15,500	6,440	6,700	2,520	34,200	85,100	34,400	8,700	6,450	3,390	3,160	11,900	7,540
3	16,100	6,440	6,190	2,520	34,200	71,900	34,700	8,220	6,010	3,100	3,010	10,600	7,540
4	13,200	6,700	5,720	2,520	35,000	65,200	36,200	11,000	5,900	2,820	3,200	9,680	7,250
5	17,800	8,790	5,290	2,410	35,000	61,800	35,500	10,800	5,900	2,730	3,010	9,180	6,970
6	22,200	7,540	4,890	2,300	32,700	59,600	33,600	9,550	5,790	2,550	2,730	8,700	4,330
7	24,300	7,250	4,700	2,300	31,200	57,800	30,900	8,110	5,360	2,280	3,200	8,290	3,990
8	22,800	7,250	4,510	2,300	28,900	52,800	27,700	7,330	4,940	2,030	3,390	8,110	3,820
9	19,400	6,970	4,330	2,300	26,100	46,900	24,800	6,670	4,520	2,280	3,100	8,110	3,350
10	16,700	6,970	3,990	2,190	24,700	41,700	22,400	6,010	4,210	2,080	2,820	8,060	3,350
11	18,300	6,970	3,660	2,190	24,000	37,800	20,400	6,340	4,320	1,870	2,860	8,530	4,510
12	19,400	6,970	3,500	2,080	23,300	34,000	18,700	7,770	4,630	1,790	2,780	8,390	5,090
13	17,900	6,700	3,350	2,300	21,900	30,900	17,600	8,940	4,420	1,790	2,640	8,580	5,290
14	13,200	6,700	3,200	2,520	22,600	27,700	16,600	11,100	4,210	1,720	2,820	8,530	5,500
15	10,800	6,700	3,050	2,910	23,300	25,300	15,400	11,100	4,000	1,720	2,920	8,110	5,720
16	12,300	6,440	2,910	3,050	24,700	33,800	14,800	11,000	3,690	2,250	3,010	7,770	5,290
17	13,400	5,950	2,910	3,050	28,200	22,200	14,000	9,800	3,300	2,110	3,100	7,330	4,700
18	12,200	5,950	2,770	4,160	35,000	21,000	14,500	9,300	3,010	2,110	3,550	6,890	4,700
19	11,400	5,950	2,770	4,890	36,900	20,400	14,800	9,680	2,920	2,110	4,170	6,740	4,890
20	12,100	5,950	2,640	5,290	41,200	21,500	14,500	15,100	2,730	2,080	5,090	7,220	4,510
21	11,600	5,950	2,640	7,540	46,600	23,000	12,700	16,000	2,640	1,920	7,220	7,880	4,160
22	10,000	5,950	2,640	14,200	46,900	22,400	11,900	13,600	2,640	1,790	10,800	7,880	4,330
23	9,200	5,950	2,520	16,800	44,500	22,400	11,600	11,600	2,460	2,640	16,200	8,820	4,330
24	9,500	6,700	2,520	18,000	44,000	24,100	11,100	10,100	2,460	4,880	16,100	11,100	4,160
25	9,200	7,250	2,520	22,600	51,600	26,400	10,200	9,180	2,550	5,160	13,900	11,400	3,990
26	9,300	8,150	2,640	24,700	72,800	25,900	9,420	8,580	2,920	5,640	13,000	11,400	3,990
27	8,800	8,150	2,520	26,100	100,000	25,900	8,700	7,770	3,200	6,670	12,900	11,000	3,990
28	8,300	8,470	2,520	27,500	120,000	25,900	8,340	7,220	3,300	5,360	14,400	7,840	3,500
29	7,700	8,150	.....	28,200	123,000	25,300	8,110	7,550	3,590	4,590	15,000	5,500	3,500
30	6,700	7,840	.....	30,400	117,000	31,300	8,110	8,220	3,390	4,100	14,600	7,540	3,500
31	6,700	7,540	.....	31,900	.....	37,800	.....	8,110	3,300	.....	14,000	.....	3,500

NOTE.—Discharge determined from a well defined rating curve. Discharge Jan. 1 to Apr. 18, and Dec. 6 to Dec. 31 estimated from gage heights at Grand Falls, N. B., furnished by H. S. Ferguson, consulting engineer, where the winter flow is not affected by ice. Grand Falls is about 14 miles below Van Buren. Discharge estimates for December, 1912, supersede those published in Water Supply Paper 321, page 20. New estimate made from a frozen season rating curve based on the record for January, 1913.

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Monthly discharge of St. John River at Van Buren, Maine, for December, 1912, to December, 1913.

[Drainage area, 8,270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
December	24,300	6,700	13,600	1.64	1.89
1913.					
January	8,790	5,950	6,940	.839	.97
February	7,250	2,520	3,740	.452	.47
March	31,900	2,060	9,810	1.19	1.37
April	123,000	21,900	45,500	5.50	6.14
May	102,000	20,400	38,700	4.68	5.40
June	36,900	8,110	19,300	2.33	2.60
July	16,000	6,010	9,440	1.14	1.31
August	7,220	2,460	4,060	.491	.57
September	6,670	1,720	2,960	.358	.40
October	16,200	2,640	6,840	.827	.95
November	13,000	5,500	8,800	1.06	1.18
December	7,540	3,350	4,800	.580	.67
The year	123,000	1,720	13,400	1.62	22.03

NOTE.—Figures for December, 1912, supersede those published in Water Supply Paper 321, page 20.

MACHIAS RIVER BASIN.

MACHIAS RIVER AT WHITNEYVILLE, MAINE.

Location.—At a wooden highway bridge in the town of Whitneyville; 4 miles above Machias; 200 feet below a storage dam.

Records available.—October 17, 1903, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—465 square miles.

Gage.—Chain gage installed on the wooden highway bridge October 10, 1911. Prior to October 3, 1905, a chain gage was located on the Washington County railroad bridge. Backwater was occasionally experienced here, however, from the dam at Machias, and on October 3, 1905, a staff gage was installed on the highway bridge three-fourths of a mile farther upstream. The datum of the present chain gage is the same as that of the staff gage on the highway bridge.

Channel and control.—Practically permanent.

Discharge measurements.—Made at the railroad bridge, as the section there is better than above. Low-water measurements may be made by wading at a point 200 feet above the railroad bridge.

Winter flow.—Little affected by ice.

Log driving.—There is a certain amount of log driving every year and jams of short duration occasionally occur.

Regulation.—The gates in the storage dam immediately above the station are opened and closed each day during low stages of the river; as a result considerable fluctuation occurs at such times.

Accuracy.—The operations of the gates of the storage dam render results somewhat uncertain.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:

May 8, 1913: Gage height, 6.77 feet; discharge, 2,490 second-feet.

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Daily gage height, in feet, of Machias River at Whitneyville, Maine, for 1913.

[I. S. Albee, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	4.5	4.4	6.5	5.2	8.2	3.5	3.6	3.6	3.5	4.8	4.3
2	7.3	5.5	4.5	6.4	5.3	7.8	3.45	3.6	3.5	3.4	4.5	4.3
3	7.5	5.2	4.6	6.5	5.5	7.5	3.4	3.55	3.4	3.35	4.4	4.35
4	8.0	4.8	4.7	6.8	5.8	7.1	3.3	3.5	3.3	3.6	4.3	4.4
5	8.6	4.6	4.7	7.0	6.0	6.8	3.3	3.5	3.3	3.8	4.3	4.5
6	6.8	4.7	4.6	7.1	6.3	6.2	3.3	3.4	3.3	3.9	4.4	4.5
7	7.0	4.8	4.5	7.2	6.7	5.6	3.3	3.4	3.4	3.9	4.35	4.6
8	6.9	4.9	4.4	7.3	6.8	5.1	3.3	3.4	3.5	3.8	4.4	6.5
9	6.8	4.8	4.4	6.3	6.9	4.9	3.3	3.4	3.6	3.7	4.7	7.0
10	6.3	4.7	4.4	6.0	7.0	4.8	3.3	3.4	3.6	3.7	5.0	6.1
11	5.8	4.7	4.4	5.5	7.1	4.7	3.3	3.4	3.6	3.7	5.0	5.7
12	5.6	4.7	4.4	5.6	6.9	4.6	3.35	3.4	3.6	3.7	5.1	5.2
13	5.4	4.8	4.4	6.0	6.7	4.4	3.4	3.4	3.6	4.7	5.1	4.8
14	5.2	4.8	4.5	7.2	6.4	4.2	3.5	3.3	3.6	5.3	5.0	4.7
15	5.1	4.6	6.3	7.0	6.2	4.0	3.5	3.3	3.6	6.5	4.9	4.6
16	5.0	4.5	8.8	6.7	6.0	4.0	3.5	3.3	3.6	6.1	4.8	4.4
17	4.9	4.4	9.0	6.1	5.9	4.0	3.5	3.3	3.6	5.5	4.7	4.2
18	4.9	4.4	8.0	5.5	5.8	4.0	3.5	3.3	3.6	5.3	4.6	4.1
19	5.5	4.4	6.7	5.9	5.6	3.95	3.5	3.3	3.6	5.2	4.5	4.0
20	5.8	4.3	7.8	6.4	5.7	3.9	3.6	3.3	3.6	5.1	4.4	4.0
21	6.0	4.3	9.0	6.2	5.8	3.9	3.6	3.3	3.6	5.1	4.6	4.0
22	5.9	4.3	8.2	6.0	5.9	3.9	3.7	3.4	3.7	5.15	4.9	4.0
23	5.8	4.3	7.1	5.9	6.0	3.8	3.8	3.5	3.9	5.2	4.8	4.0
24	5.7	4.3	6.9	6.1	6.2	3.7	3.9	3.6	4.0	5.3	4.7	4.0
25	5.5	4.3	7.9	6.8	6.4	3.7	4.0	3.6	4.2	5.4	4.6	4.0
26	5.3	4.3	9.0	6.7	6.5	3.7	4.0	3.7	4.3	5.5	4.5	4.0
27	5.2	4.4	8.4	6.6	6.6	3.6	4.0	3.7	4.4	6.0	4.4	4.0
28	5.0	4.4	10.2	6.4	6.6	3.6	3.9	3.7	4.0	6.8	4.3	3.9
29	4.8	.....	9.0	6.0	7.0	3.5	3.8	3.65	3.8	6.4	4.3	3.8
30	4.6	.....	8.0	5.6	8.0	3.5	3.7	3.6	3.6	6.0	4.3	3.8
31	4.5	.....	6.9	.....	8.6	.....	3.6	3.6	.....	5.4	.....	3.8

Daily discharge, in second-feet, of Machias River at Whitneyville, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,650	755	698	2,200	1,210	3,780	260	300	300	260	937	642
2	2,920	1,420	755	2,120	1,280	3,380	242	300	260	224	755	642
3	3,100	1,210	814	2,200	1,420	3,100	224	280	224	208	698	670
4	3,580	937	875	2,470	1,640	2,740	191	260	191	300	642	698
5	4,180	814	875	2,650	1,800	2,470	191	260	191	387	642	755
6	2,470	875	814	2,740	2,040	1,960	191	224	191	433	698	755
7	2,650	937	755	2,830	2,380	1,490	191	224	224	433	670	814
8	2,560	1,000	698	2,920	2,470	1,140	191	224	260	387	698	2,200
9	2,470	937	698	2,040	2,560	1,000	191	224	300	343	875	2,650
10	2,040	875	698	1,800	2,650	937	191	224	300	343	1,070	1,880
11	1,640	875	698	1,420	2,740	875	191	224	300	343	1,070	1,560
12	1,490	875	698	1,490	2,560	814	208	224	300	343	1,140	1,210
13	1,350	937	698	1,800	2,380	698	224	224	300	875	1,140	937
14	1,210	937	755	2,830	2,120	587	260	191	300	1,280	1,070	875
15	1,140	814	1,960	2,650	1,960	482	260	191	300	2,200	1,000	814
16	1,070	755	4,380	2,380	1,800	482	260	191	300	1,880	937	698
17	1,000	698	4,580	1,880	1,720	482	260	191	300	1,420	875	587
18	1,000	698	3,580	1,420	1,640	482	260	191	300	1,280	814	534
19	1,420	698	2,380	1,720	1,490	458	260	191	300	1,210	755	482
20	1,640	642	3,380	2,120	1,560	433	300	191	300	1,140	698	482
21	1,800	642	4,580	1,960	1,640	433	300	191	300	1,140	814	482
22	1,720	642	3,780	1,800	1,720	433	343	224	343	1,180	1,000	482
23	1,640	642	2,740	1,720	1,800	387	387	260	433	1,210	937	482
24	1,560	642	2,560	1,880	1,960	343	433	300	482	1,280	875	482
25	1,420	642	3,480	2,470	2,120	343	482	300	587	1,350	814	482
26	1,280	642	4,580	2,380	2,200	343	482	343	642	1,420	755	482
27	1,210	698	3,980	2,290	2,290	300	482	343	698	1,800	698	482
28	1,070	698	5,900	2,120	2,290	300	433	343	482	2,470	642	433
29	937	.....	4,580	1,800	2,650	260	387	322	387	2,120	642	387
30	814	.....	3,580	1,490	3,580	260	343	300	300	1,800	642	387
31	755	.....	2,560	.....	4,180	.....	300	300	.....	1,350	.....	387

NOTE.—Discharge determined from a rating curve well defined between 200 and 4,000 second-feet.

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Monthly discharge of Machias River at Whitneyville, Maine, for 1913.

[Drainage area, 465 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	4,180	755	1,800	3.87	4.46
February	1,420	642	819	1.76	1.83
March	5,900	698	2,360	5.08	5.85
April	2,920	1,420	2,120	4.56	5.09
May	4,180	1,210	2,120	4.56	5.26
June	3,780	260	1,040	2.24	2.50
July	482	191	288	.619	.71
August	343	191	250	.538	.62
September	698	191	336	.723	.81
October	2,470	208	1,040	2.24	2.58
November	1,140	642	833	1.79	2.00
December	2,650	387	802	1.72	1.98
The year	5,900	191	1,150	2.47	33.70

UNION RIVER BASIN.

UNION RIVER AT AMHERST, MAINE.

Location.—At highway bridge three-fourths of a mile west of Amherst post office on road to Bangor, about a mile below the highway bridge at the old tannery dam.

Records available.—July 25, 1909, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—140 square miles.

Gage.—Chain, established June 2, 1910, and placed at same datum as old vertical gage nailed to log abutment.

Channel and control.—Gravel, but not liable to change except in an unusual flood.

Discharge measurements.—Made from downstream side of the bridge.

Winter flow.—Affected by ice.

Regulation.—A few log-driving dams above the station, but the regimen of stream is only slightly affected by them.

Accuracy.—Discharge relation affected by ice and to a certain extent, but for short periods, by backwater from log jams. No corrections have been made for possible backwater from log jams.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:

May 30, 1913: Gage height, 9.91 feet; discharge, 1,050 second-feet.

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Daily gage height, in feet, of Union River at Amherst, Maine, for 1913.

[Lewis Watts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.18	7.92	.....	11.34	8.00	9.06	6.04	5.80	5.29	6.44	9.26	6.92
2	8.82	8.02	8.90	10.82	7.84	8.96	5.96	5.77	5.27	6.43	8.95	6.95
3	7.78	8.47	.....	10.50	7.71	8.78	5.88	5.72	5.24	6.97	8.63	6.82
4	10.94	8.52	.....	10.10	7.62	8.61	5.82	5.72	5.45	6.92	8.39	6.81
5	9.20	8.60	8.70	10.40	7.50	8.43	5.80	5.69	5.36	7.23	8.20	6.80
6	9.04	9.20	.....	10.30	7.41	8.18	5.92	5.64	5.32	7.11	7.97	6.92
7	8.96	.....	.....	10.00	7.36	7.98	5.88	5.60	5.32	7.17	7.77	7.30
8	8.74	.....	.....	9.90	7.28	7.78	5.84	5.45	5.35	7.16	7.60	8.19
9	8.60	9.18	8.60	9.15	7.18	7.72	5.80	5.29	5.55	7.05	7.55	7.78
10	9.28	.....	.....	8.74	7.21	7.42	6.10	5.20	5.42	6.93	7.90	8.00
11	9.58	.....	.....	8.52	7.18	7.29	6.24	5.18	5.42	6.86	7.90	7.61
12	9.84	9.15	.....	8.79	7.10	7.08	6.10	5.18	5.42	6.99	7.78	8.50
13	8.70	.....	8.55	8.81	7.05	6.92	6.10	5.18	5.52	7.57	7.60	7.78
14	9.70	.....	.....	9.34	7.04	6.76	6.10	5.18	6.17	7.67	7.52	7.08
15	9.78	.....	9.65	9.30	6.98	6.69	6.10	5.18	5.64	7.13	7.50	7.10
16	.....	.....	10.90	9.28	6.95	6.62	6.08	5.18	5.61	8.20	7.39	7.72
17	.....	8.85	.....	9.24	6.82	6.64	6.06	5.17	5.61	8.09	7.29	7.56
18	.....	.....	.....	9.08	6.77	6.52	6.04	5.15	5.68	8.07	7.21	6.92
19	9.80	8.80	10.10	9.02	6.68	6.42	6.02	5.12	5.66	7.91	7.10	6.95
20	9.90	.....	10.06	9.16	6.30	6.38	6.00	5.10	5.65	7.84	7.57	7.26
21	10.09	.....	12.38	8.92	6.28	6.34	6.04	5.10	5.65	9.98	7.65	7.15
22	9.51	.....	12.24	8.82	6.32	6.28	6.03	5.10	5.84	9.35	7.70	6.92
23	.....	8.78	11.12	8.66	6.84	6.20	6.01	5.20	7.88	9.02	7.65	6.99
24	9.00	.....	11.12	8.56	7.24	6.18	6.00	5.17	6.99	8.86	7.61	7.55
25	8.89	.....	11.42	8.46	7.26	6.15	6.00	5.14	6.80	8.86	7.45	7.90
26	8.73	8.60	12.25	8.39	7.43	6.09	5.97	5.12	6.86	9.73	7.34	6.98
27	8.05	.....	11.66	8.32	7.97	6.04	5.94	5.20	6.88	10.54	7.21	7.28
28	8.10	.....	12.48	8.27	8.11	6.00	5.92	5.19	6.79	10.17	7.19	7.68
29	8.19	.....	11.63	8.23	8.13	5.92	5.90	5.15	6.68	9.92	7.16	7.76
30	8.20	.....	11.12	8.15	9.68	5.90	5.87	5.48	6.56	9.72	7.00	7.89
31	7.90	.....	10.78	.....	9.52	.....	5.81	5.37	.....	9.47	.....	7.69

NOTE.—Discharge relation affected by ice Jan. 10–23 and Feb. 6 to Mar. 20.

Daily discharge, in second-feet, of Union River at Amherst, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	792	465	270	1,580	484	753	103	72	34	164	814	245
2	688	489	280	1,370	450	724	90	68	31	164	724	254
3	433	597	300	1,250	415	682	83	63	31	254	643	226
4	1,420	610	320	1,110	392	630	72	63	44	245	580	226
5	798	630	330	1,220	369	592	72	63	37	314	532	226
6	750	500	300	1,180	347	532	83	59	34	284	472	245
7	727	470	280	1,070	336	484	83	55	34	294	426	325
8	666	460	270	1,040	325	438	78	44	37	294	392	532
9	630	420	270	783	304	415	72	34	51	274	380	438
10	600	400	270	669	304	347	110	28	40	254	461	484
11	580	390	270	605	304	325	132	28	40	236	461	392
12	570	380	270	682	284	284	110	28	40	264	438	605
13	540	380	270	682	274	245	110	28	47	380	392	438
14	520	370	330	846	274	217	110	28	118	404	369	284
15	500	330	948	830	264	208	110	28	59	294	369	284
16	480	280	1,400	830	254	190	110	28	55	532	347	415
17	470	270	2,000	814	226	199	103	26	55	508	325	380
18	470	270	1,560	768	217	173	103	26	63	496	304	245
19	490	270	1,110	738	208	156	96	23	59	461	294	254
20	540	270	1,100	783	140	156	96	23	59	450	380	314
21	630	270	1,990	710	325	148	103	23	59	1,070	404	294
22	780	270	1,940	682	325	140	103	23	78	846	415	245
23	750	270	1,490	643	236	125	96	28	461	738	404	264
24	738	270	1,490	618	314	125	96	26	264	696	392	380
25	707	270	1,610	592	314	118	96	26	226	696	358	461
26	664	270	1,940	580	358	110	90	23	236	984	336	264
27	496	270	1,700	556	472	103	90	28	245	1,270	304	325
28	508	270	2,030	544	508	96	83	28	226	1,130	304	415
29	530	.....	1,690	544	520	83	83	26	208	1,040	294	426
30	532	.....	1,490	520	966	83	78	47	182	966	264	461
31	461	.....	1,360	.....	896	.....	72	37	.....	879	.....	415

NOTE.—Discharge determined from a rating curve well defined between 15 and 700 second-feet, but very poorly defined above 700 second-feet. Discharge Jan. 10–23 and Feb. 6 to Mar. 20 estimated by hydrograph comparison with records on Machias River at Whitneyville and subject to some uncertainty.

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Monthly discharge of Union River at Amherst, Maine, for 1913.

[Drainage area, 140 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	1,420	433	628	4.49	5.18
February	.....	.....	359	2.56	2.66
March	2,030	200	996	7.11	8.20
April	1,580	520	828	5.91	6.59
May	966	140	368	2.63	3.03
June	753	83	296	2.11	2.35
July	132	72	94	.67	.77
August	72	23	37	.26	.30
September	461	31	105	.75	.84
October	1,270	164	544	3.88	4.47
November	814	264	419	2.99	3.34
December	605	226	347	2.48	2.86
The year	2,030	23	420	3.00	40.59

GREEN LAKE STREAM AT LAKEWOOD, MAINE.

Location.—At highway bridge half a mile below dam at outlet of Green Lake, half a mile from Lakewood post office, and 8 miles from Ellsworth.

Records available.—July 1, 1909, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—47 square miles.

Gage.—Seven-foot staff, nailed to right-hand abutment, upstream side of bridge.

Channel and control.—Practically permanent; banks not subject to overflow.

Discharge measurements.—Made from lower side of bridge.

Winter flow.—Not seriously affected by ice.

Regulation.—The dam half a mile above the station at the outlet of the lake controls the storage of the lake, and records do not show the natural flow.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:

May 27, 1913: Gage height, 3.05 feet; discharge, 92.8 second-feet.

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Daily gage height, in feet, of Green Lake Stream at Lakewood, Maine, for 1913.

[M. A. Garland, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.9	3.3	3.3	4.2	3.4	3.0	2.8	2.7	3.0	2.8	2.8	2.9
2	3.0	3.3	3.3	4.2	3.4	3.0	2.8	2.7	3.0	2.8	2.8	2.9
3	3.0	3.3	3.3	4.2	3.4	3.0	2.8	2.7	3.0	2.8	2.8	2.9
4	3.0	3.3	3.3	4.2	3.4	3.0	2.8	2.7	3.0	2.8	2.8	2.9
5	3.05	3.3	3.3	4.2	3.4	3.0	2.8	2.7	3.0	2.8	2.8	2.9
6	3.1	3.3	3.3	4.2	3.35	3.0	2.8	2.7	3.0	2.8	2.85	2.9
7	3.1	3.3	3.3	4.2	3.3	3.0	2.8	2.7	3.0	2.8	2.9	2.9
8	3.15	3.3	3.3	4.2	3.25	3.0	2.8	2.7	3.0	2.8	2.9	2.9
9	3.2	3.3	3.3	4.1	3.2	3.0	2.8	2.7	3.0	2.8	2.9	2.9
10	3.2	3.3	3.3	4.1	3.2	3.0	2.8	2.7	3.0	2.8	2.9	2.95
11	3.2	3.3	3.3	4.0	3.2	3.0	2.8	2.7	3.0	2.8	2.9	3.0
12	3.25	3.3	3.3	3.9	3.2	3.0	2.8	2.7	3.0	2.8	2.9	3.0
13	3.3	3.3	3.3	3.8	3.2	3.0	2.8	2.7	3.0	2.8	2.9	3.0
14	3.3	3.3	3.3	3.7	3.2	3.0	2.8	3.4	3.0	2.8	2.9	3.0
15	3.3	3.3	3.3	3.7	3.2	3.0	2.8	3.4	3.0	2.8	2.9	3.0
16	3.3	3.3	3.3	3.7	3.2	3.0	2.8	3.4	2.6	2.8	2.9	3.0
17	3.3	3.3	3.3	3.7	3.2	3.0	2.8	3.4	2.6	2.8	2.9	3.0
18	3.3	3.3	3.3	3.7	3.2	3.0	2.8	3.4	2.6	2.8	2.9	3.0
19	3.3	3.3	3.3	3.65	3.2	3.0	2.8	3.4	2.6	2.8	2.9	3.0
20	3.3	3.3	3.3	3.6	3.15	3.0	2.75	3.4	3.0	2.8	2.9	3.0
21	3.3	3.3	3.3	3.6	3.1	3.0	2.75	3.4	3.0	2.8	2.9	3.0
22	3.35	3.3	3.3	3.55	3.05	3.0	2.7	3.4	3.0	2.8	2.9	3.0
23	3.35	3.3	3.6	3.5	3.0	3.0	2.7	3.4	3.0	2.8	2.9	3.0
24	3.35	3.3	3.8	3.45	3.0	3.0	2.7	3.4	3.0	2.8	2.9	3.0
25	3.35	3.3	4.2	3.4	3.0	3.0	2.7	3.4	3.0	2.8	2.9	3.0
26	3.35	3.3	4.2	3.4	3.0	2.95	2.7	3.4	2.8	2.8	2.9	3.0
27	3.3	3.3	4.2	3.4	3.0	2.9	2.7	3.4	2.8	2.8	2.9	3.0
28	3.3	3.3	4.2	3.4	3.0	2.85	2.7	3.4	2.8	2.8	2.9	3.0
29	3.3	.....	4.2	3.4	3.0	2.8	2.7	3.4	2.8	2.8	2.9	3.0
30	3.3	.....	4.2	3.4	3.0	2.8	2.7	3.4	2.8	2.8	2.9	3.0
31	3.3	.....	4.2	.....	3.0	.....	2.7	3.4	.....	2.8	.....	3.0

Daily discharge, in second-feet, of Green Lake Stream at Lakewood, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	77	177	177	570	211	96	62	49	96	62	62	77
2	96	177	177	570	211	96	62	49	96	62	62	77
3	96	177	177	570	211	96	62	49	96	62	62	77
4	96	177	177	570	211	96	62	49	96	62	62	77
5	108	177	177	570	211	96	62	49	96	62	62	77
6	119	177	177	570	194	96	62	49	96	62	70	77
7	119	177	177	570	177	96	62	49	96	62	77	77
8	132	177	177	570	162	96	62	49	96	62	77	77
9	146	177	177	520	146	96	62	49	96	62	77	77
10	146	177	177	520	146	96	62	49	96	62	77	86
11	146	177	177	471	146	96	62	49	96	62	77	96
12	162	177	177	423	146	96	62	49	96	62	77	96
13	177	177	177	376	146	96	62	49	96	62	77	96
14	177	177	177	331	146	96	62	211	96	62	77	96
15	177	177	177	331	146	96	62	211	96	62	77	96
16	177	177	177	331	146	96	62	211	38	62	77	96
17	177	177	177	331	146	96	62	211	38	62	77	96
18	177	177	177	331	146	96	62	211	38	62	77	96
19	177	177	177	310	146	96	62	211	38	62	77	96
20	177	177	177	288	132	96	56	211	96	62	77	96
21	177	177	177	288	119	96	56	211	96	62	77	96
22	194	177	177	268	108	96	49	211	96	62	77	96
23	194	177	288	248	96	96	49	211	96	62	77	96
24	194	177	376	230	96	96	49	211	96	62	77	96
25	194	177	570	211	96	96	49	211	96	62	77	96
26	194	177	570	211	96	86	49	211	62	62	77	96
27	177	177	570	211	96	77	49	211	62	62	77	96
28	177	177	570	211	96	70	49	211	62	62	77	96
29	177	.....	570	211	96	62	49	211	62	62	77	96
30	177	.....	570	211	96	62	49	211	62	62	77	96
31	177	.....	570	.....	96	.....	49	211	.....	62	.....	96

NOTE.—Discharge determined from a rating curve fairly well defined above 20 second-feet.

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Monthly discharge of Green Lake Stream at Lakewood, Maine, for 1913.

[Drainage area, 47 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	194	77	158	3.36	3.87
February	177	177	177	3.77	3.93
March	570	177	276	5.88	6.78
April	570	211	381	8.11	9.05
May	211	96	142	3.02	3.48
June	96	62	92	1.96	2.19
July	62	49	57	1.21	1.40
August	211	49	143	3.04	3.50
September	96	38	83	1.76	1.96
October	62	62	62	1.32	1.52
November	77	62	74	1.57	1.75
December	96	77	90	1.91	2.20
The year	570	38	144	3.08	41.63

BRANCH LAKE NEAR ELLSWORTH, MAINE.

Location.—At the Branch Pond Lumber Co.'s mill, at the lower end of Branch Lake, 5 miles from Ellsworth.

Records available.—June 29, 1909, to December 31, 1913.

Area of lake surface.—4.33 square miles.

Gage.—Vertical staff nailed to corner of mill near the intake to the wheels.

Altitude.—Altitude as determined by Geological Survey, 236 feet above sea level, and this height was assumed as the height of the water surface at the time of the Union River surveys.[1] In accordance with this assumption, the top of the mill-pond dam at the lower end of the lake is 240 feet above sea level.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Daily gage height, in feet, of Branch Lake near Ellsworth, Maine, for 1913.

[L. H. Cushman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	7.25	.....	.....	7.05	.....	.....	.....	.....	4.95	.....
2	.....	8.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	5.7	4.8	.....	.....	.....	.....
4	.....	.....	.....	.....	7.5	.....	.....	.....	.....	.....	.....	.....
5	8.4	.....	.....	.....	.....	.....	.....	.....	.....	3.15	.....	.....
6	.....	.....	.....	8.75	.....	.....	.....	.....	.....	3.1	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	.....	3.45	.....	.....	5.05
8	.....	.....	.....	.....	.....	7.05	.....	.....	.....	.....	.....	.....
9	.....	8.1	7.0	.....	.....	.....	.....	.....	.....	.....	4.8	.....
10	.....	.....	.....	.....	.....	.....	.....	4.5	.....	.....	.....	5.55
11	.....	.....	.....	.....	7.35	.....	.....	.....	.....	.....	.....	.....
12	8.5	.....	.....	.....	.....	.....	.....	.....	3.3	3.15	.....	.....
13	.....	.....	.....	8.0	.....	.....	5.65	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	4.35	3.3	.....	.....	5.6
15	.....	.....	.....	.....	.....	7.15	.....	.....	.....	.....	.....	.....
16	8.5	7.7	7.25	.....	.....	.....	.....	.....	3.1	.....	5.1	.....
17	.....	.....	.....	7.8	.....	.....	.....	4.1	.....	.....	.....	.....
18	.....	.....	.....	.....	6.95	.....	.....	.....	.....	.....	.....	.....
19	8.7	.....	.....	.....	.....	.....	.....	.....	.....	3.5	.....	.....
20	.....	.....	.....	7.85	.....	.....	5.3	3.85	.....	.....	.....	.....
21	8.7	.....	.....	.....	.....	.....	.....	.....	2.8	.....	.....	5.5
22	.....	.....	.....	.....	.....	6.35	.....	.....	.....	.....	.....	.....
23	.....	7.45	8.4	.....	.....	.....	.....	.....	.....	.....	5.2	.....
24	.....	.....	.....	.....	.....	.....	.....	3.7	.....	.....	.....	.....
25	.....	.....	.....	7.7	6.9	.....	.....	.....	.....	.....	.....	.....
26	8.65	.....	.....	.....	.....	.....	.....	.....	.....	4.3	.....	.....
27	.....	.....	.....	7.6	.....	.....	5.5	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....	.....	.....	.....	3.15	.....	.....	5.55
29	.....	.....	.....	.....	.....	5.9	.....	.....	.....	.....	.....	.....
30	.....	.....	9.1	.....	.....	.....	.....	.....	.....	.....	5.1	.....
31	.....	.....	.....	.....	.....	.....	.....	3.6	.....	.....	.....	.....

[1] U. S. Geol. Survey Water-Supply Paper 281, p. 57, 1912.

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BRANCH LAKE STREAM NEAR ELLSWORTH, MAINE.

Location.—At small highway bridge immediately below the sawmill at outlet of Branch Lake, 5 miles from Ellsworth.

Records available.—July 1, 1909, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—31 square miles.

Gage.—Seven-foot staff nailed to right abutment downstream side of bridge.

Channel and control.—Gravelly and permanent in natural condition; fills up with sawmill waste, but generally clears itself during spring freshets.

Discharge measurements.—Made from highway bridge.

Winter flow.—Not seriously affected by ice.

Regulation.—The flow from the lake is regulated in the interest of the sawmill and power plants at Ellsworth.

Accuracy.—Results fair.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Branch Lake Stream near Ellsworth, Maine, during 1913.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
May 27	4.60	77.0	May 27	5.10	143
27	4.98	122			

Daily gage height, in feet, of Branch Lake Stream near Ellsworth, Maine, for 1913.

[L. H. Cushman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						4.60						
2		4.80	4.70									
3							4.35	4.30			4.30	
4					4.55							
5	4.25									4.15		
6				5.15								
7									4.15			4.30
8						4.60						
9		4.75	4.65								4.30	
10								4.30				4.30
11					4.55				4.18			
12	4.35									4.15		
13				5.10								
14								5.00	4.50			4.30
15						4.60						
16	4.38	4.65	4.70						4.65		4.30	
17				4.95				4.90				
18					4.55							
19	4.37									4.20		
20				4.80			4.30	4.20				
21	4.60								4.48			4.30
22						4.60						
23		4.70	4.80								4.30	
24								4.15				
25				4.65	4.60							
26	4.35									4.20		
27				4.50			4.30					
28									4.15			4.30
29						4.60						
30			5.00								4.30	
31								4.15				

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Daily discharge, in second-feet, of Branch Lake Stream at Ellsworth, Maine, for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	35	30	48	51	56	85	34	32	30	35	37	35
2	35	30	42	50	56	88	37	33	30	35	33	35
3	35	30	35	48	50	88	41	34	30	35	30	35
4	35	30	35	47	45	88	45	35	30	35	30	35
5	35	30	34	46	40	88	48	36	30	35	31	35
6	35	30	34	44	40	88	52	37	30	35	32	35
7	35	30	33	44	40	88	76	38	30	35	33	35
8	35	30	33	43	39	88	76	38	30	34	34	35
9	35	30	32	42	38	88	64	39	33	33	35	35
10	35	30	32	42	37	80	52	40	36	32	35	35
11	35	30	33	42	36	72	46	40	40	31	50	35
12	35	30	34	41	35	65	41	40	43	30	62	35
13	35	29	34	40	60	58	36	41	46	30	75	35
14	35	28	34	40	67	52	30	42	60	34	88	35
15	30	28	35	38	74	46	30	43	74	38	88	35
16	37	27	44	35	81	40	30	44	71	43	64	34
17	44	26	54	35	88	40	30	44	68	47	40	33
18	42	26	56	33	88	38	30	44	65	52	40	33
19	40	26	58	34	88	36	30	44	63	56	40	33
20	37	27	60	34	88	35	30	44	54	60	40	31
21	35	28	62	35	88	34	30	44	44	49	40	30
22	35	28	65	35	88	32	30	44	35	50	40	30
23	35	29	64	36	88	30	30	44	36	52	40	30
24	35	30	62	38	84	30	30	44	37	53	40	30
25	34	30	60	40	80	30	30	44	38	54	40	30
26	32	36	58	41	76	30	30	44	39	55	39	30
27	31	42	57	43	76	30	30	42	40	56	38	30
28	30	48	56	44	77	30	30	41	38	52	38	30
29	30	54	54	48	78	30	30	40	35	48	37	30
30	30	.....	53	52	78	30	31	40	35	44	36	30
31	30	.....	52	.....	82	.....	32	35	.....	40	.....	30
1913.												
1	30	94	88	122	67	76	63	44	30	30	41	44
2	32	101	88	136	68	76	56	44	30	30	42	44
3	34	100	87	140	69	76	49	44	30	30	44	44
4	36	99	86	144	70	76	48	44	30	30	44	44
5	38	98	85	148	70	76	47	44	30	30	44	44
6	39	97	85	152	70	76	46	44	30	30	44	44
7	41	96	84	150	70	76	45	44	30	30	44	44
8	42	95	83	149	70	76	44	44	31	39	44	44
9	44	94	82	148	70	76	44	44	32	30	44	44
10	45	92	83	147	70	76	44	44	33	30	44	44
11	47	90	84	146	70	76	44	65	35	30	44	44
12	48	88	85	145	70	76	44	86	45	30	44	44
13	49	87	85	144	70	76	44	107	55	30	44	44
14	50	85	86	138	70	76	44	129	65	30	44	44
15	50	83	87	133	70	76	44	124	73	31	44	44
16	51	82	88	127	70	76	44	119	82	32	44	44
17	51	83	90	122	70	76	44	114	79	33	44	44
18	50	84	92	115	70	76	44	88	75	34	44	44
19	50	85	94	108	70	76	44	62	72	35	44	44
20	63	85	95	101	71	76	44	35	68	35	44	44
21	76	86	97	98	72	76	44	34	65	35	44	44
22	70	87	99	94	73	76	44	33	60	35	44	44
23	65	88	101	91	74	76	44	32	55	35	44	44
24	59	88	105	87	75	76	44	30	50	35	44	44
25	54	88	109	82	76	76	44	30	45	35	44	44
26	48	88	113	74	76	76	44	30	40	35	44	44
27	56	88	117	65	76	76	44	30	35	36	44	44
28	63	88	120	65	76	76	44	30	30	37	44	44
29	71	.....	124	65	76	76	44	30	30	38	44	44
30	78	.....	128	66	76	70	44	30	30	39	44	44
31	86	.....	128	.....	76	.....	44	30	.....	40	.....	44

NOTE.—Discharge determined from a rating curve well defined between 10 and 160 second-feet. Discharge interpolated for days when no gage height was reported.

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Monthly discharge of Branch Lake Stream near Ellsworth, Maine, for 1912–13.

[Drainage area, 31 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	44	30	34.7	1.12	1.29
February	54	26	31.1	1.00	1.08
March	65	32	46.5	1.50	1.73
April	52	33	41.4	1.34	1.50
May	88	35	65.8	2.12	2.44
June	88	30	55.2	1.78	1.99
July	76	30	38.4	1.24	1.43
August	44	32	40.3	1.30	1.50
September	74	30	42.3	1.36	1.52
October	60	30	42.5	1.37	1.58
November	88	30	43.5	1.40	1.56
December	35	30	32.8	1.06	1.22
The year	88	26	42.9	1.38	18.84
1913.					
January	86	30	52	1.68	1.94
February	101	82	90	2.90	3.02
March	128	82	96	3.10	3.57
April	152	65	117	3.77	4.21
May	76	67	72	2.32	2.68
June	76	70	76	2.45	2.73
July	63	44	45	1.45	1.67
August	129	30	55	1.77	2.04
September	82	30	46	1.48	1.65
October	40	30	33	1.06	1.22
November	44	41	44	1.42	1.58
December	44	44	44	1.42	1.64
The year	152	30	64	2.06	27.96

PENOBSCOT RIVER BASIN.

WEST BRANCH OF PENOBSCOT RIVER AT MILLINOCKET, MAINE.

Location.—Quakish Lake dam and the Millinocket mill of the Great Northern Paper Co. at Millinocket, Maine.

Records available.—January 11, 1901, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—1,880 square miles.

Gage.—Automatic recording gage at Quakish Lake dam and gages in the forebay and tailraces at the mill.

Channel and control.—Crest of concrete dam.

Determination of discharge.—The flow is computed by considering the flow over the dam, the flow through the wheels, and the water used from time to time through the log sluices, filters, etc. The wheels were rated at Holyoke, Mass., before being placed in position. When the flow of the river is less than 2,500 second-feet, all of the water generally flows through the wheels of the mill.

Winter flow.—No difficulty is experienced in winter on account of ice affecting the estimates of discharge or the running of the wheels. Ferguson Pond, just above the entrance to the canal, eliminates effect from anchor ice.

Regulation.—Storage dams at the outlet of North Twin Lake and at the outlet of Chesuncook Lake store water on a surface of about 65 square miles with a capacity of about 32,000,000,000 cubic feet. Except during the time (usually in August) when excess water has to be supplied for log driving on the river below Millinocket and for a short time during the spring freshet, run-off is regulated by storage. Results corrected for storage.

Cooperation.—Results obtained and computations made by engineers of the Great Northern Paper Co., who furnish these data to the Survey. Since 1912 the company has preferred to furnish values of monthly discharge only.

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Monthly discharge of West Branch of Penobscot River at Millinocket, Maine, for 1911-1913.

[Drainage area, 1,880 square miles.]

Month.	Discharge in second-feet.			Run-off (depth in inches on drainage area).
	As observed.	As corrected for storage.	Per square mile.	
1911.				
January	2,190	380	0.202	0.23
February	1,430	430	.229	.24
March	687	450	.239	.28
April	1,100	2,100	1.12	1.25
May	2,390	9,150	4.87	5.62
June	2,340	2,480	1.32	1.47
July	2,220	950	.505	.58
August	2,320	1,040	.553	.64
September	2,210	1,290	.686	.77
October	2,220	1,650	.878	1.01
November	2,160	1,520	.808	.90
December	2,010	3,480	1.85	2.13
The year	1,940	2,090	1.11	15.14
1912.				
January	2,060	1,970	1.05	1.21
February	2,040	874	.465	.50
March	2,030	1,100	.585	.67
April	2,300	8,020	4.27	4.76
May	6,630	10,800	5.74	6.62
June	7,510	7,260	3.86	4.31
July	3,400	1,700	.904	1.04
August	2,390	3,340	1.78	2.05
September	2,210	1,690	.899	1.00
October	2,240	2,930	1.56	1.80
November	6,340	5,660	3.01	3.36
December	3,270	2,400	1.28	1.48
The year	3,520	3,980	2.12	28.80
1913.				
January	2,170	1,970	1.05	1.21
February	2,170	1,050	.559	.58
March	2,360	2,590	1.38	1.59
April	6,120	9,580	5.10	5.69
May	6,820	6,980	3.71	4.28
June	3,800	3,590	1.91	2.13
July	2,560	1,900	1.01	1.13
August	2,220	1,030	.548	.63
September	2,300	1,130	.601	.67
October	2,320	2,620	1.39	1.60
November	2,340	3,020	1.61	1.80
December	2,330	1,930	1.03	1.19
The year	3,130	3,120	1.66	22.50

NOTE.—Similar data for the years 1901 to 1910 are published in Water-Supply Paper 279, pages 191-193.

PENOBSCOT RIVER AT WEST ENFIELD, MAINE.

Location.—At the steel highway bridge, 1,000 feet below Piscataquis River and a mile below West Enfield.

Records available.—January 1, 1902, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—6,600 square miles.

Gages.—Standard chain gage and water-stage recorder.

Channel and control.—Practically permanent; channel at gage broken by four bridge piers.

Winter flow.—Affected by ice.

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Regulation.—Flow of the river since about 1900 largely regulated by storage, principally in the lakes tributary to the West Branch. About a mile above the station is the dam of the International Paper Co., and the Piscataquis is dammed near its mouth. Considerable water is held above these two dams at night. At low stages daily fluctuations in gage heights are caused by variations in wheel-gate openings.

Accuracy.—Results good except estimates of winter flow prior to 1913.

Cooperation.—Discharge measurements made by the students of the University of Maine under the direction of Prof. H. S. Boardman. Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Penobscot River at West Enfield, Maine, during 1913.

[Made by students of University of Maine under direction of Prof. H. S. Boardman.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Sept. 25	4.90	11,100	Oct. 2	2.77	4,810	Oct. 8	3.22	5,690
25	4.90	10,400	2	2.77	4,820	28	10.02	36,100
27	3.79	7,380	8	3.22	5,830	31	8.43	27,300
27	3.79	7,240						

Daily gage height, in feet, of Penobscot River at West Enfield, Maine, for 1913.

[T. W. Clark, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.35	5.6	5.75	11.05	11.85	8.6	3.25	3.2	2.8	2.9	7.8	3.75
2	4.5	6.05	5.75	11.45	11.15	8.6	3.35	3.1	2.9	2.85	7.2	3.9
3	4.7	6.15	5.2	10.3	10.65	8.3	3.3	3.05	2.85	3.1	6.9	3.9
4	5.85	6.4	5.55	9.85	10.05	8.0	3.15	3.2	2.85	3.45	6.5	3.9
5	6.65	6.2	5.8	9.0	9.1	7.6	3.05	3.35	2.8	3.65	6.1	3.9
6	6.2	6.05	5.7	8.7	8.25	6.8	2.95	3.3	2.55	3.4	5.75	3.75
7	6.2	5.9	5.7	8.25	7.45	6.7	2.95	3.2	2.35	3.45	5.55	3.55
8	6.2	5.8	5.6	7.7	7.55	6.3	3.05	3.05	2.3	3.15	5.3	4.35
9	6.25	5.8	5.5	7.4	7.85	6.0	3.05	2.95	2.25	3.05	5.15	5.75
10	6.15	5.3	5.15	6.8	7.85	6.0	3.15	2.85	2.35	3.05	5.4	5.4
11	6.05	5.45	5.5	7.75	7.65	6.0	3.4	2.45	2.35	3.0	6.75	5.25
12	6.05	5.8	5.7	8.05	7.3	5.4	3.95	2.9	2.35	2.9	6.3	4.6
13	6.35	5.75	5.6	8.65	6.95	5.2	3.7	2.9	2.35	3.05	5.8	4.55
14	6.65	5.7	5.6	8.85	6.75	4.8	3.55	2.85	2.3	3.25	5.45	4.7
15	6.75	5.75	5.9	9.35	6.75	4.4	3.65	2.75	2.05	3.55	5.25	4.1
16	6.6	5.65	6.5	9.9	6.8	4.4	3.75	2.65	2.15	3.9	5.05	3.65
17	6.35	5.75	7.3	10.05	6.65	4.75	3.7	2.55	2.35	4.3	4.9	3.75
18	6.05	5.8	7.6	10.1	6.4	5.1	4.1	2.25	2.35	4.4	4.9	4.1
19	6.25	6.1	7.35	10.35	5.4	5.2	4.85	2.35	2.4	4.3	4.65	3.95
20	6.2	6.1	7.45	11.25	5.3	5.0	5.05	2.4	2.3	4.4	4.95	3.7
21	6.9	5.85	8.55	10.75	4.9	4.75	4.85	2.4	2.25	7.1	5.55	3.8
22	7.45	5.85	11.25	10.2	5.0	4.5	4.65	2.35	2.1	9.5	5.4	3.7
23	7.45	5.9	13.2	10.0	5.55	4.1	4.5	2.45	2.8	8.0	5.05	3.7
24	7.2	5.4	13.25	10.7	5.85	4.3	4.4	2.35	5.35	7.05	4.95	3.55
25	6.8	5.8	12.7	11.0	6.2	4.1	4.3	2.2	4.85	6.7	4.95	3.5
26	6.5	5.9	13.45	11.25	6.2	3.8	4.25	2.5	4.2	7.15	4.65	3.4
27	5.95	5.8	13.1	11.4	6.75	3.3	4.15	2.6	3.75	9.0	4.45	3.55
28	6.2	5.8	12.55	11.5	6.35	3.35	3.6	2.7	3.4	9.9	4.2	.....
29	6.05	.....	12.55	11.7	6.6	3.2	3.2	2.75	3.15	9.5	3.9	.....
30	5.8	.....	11.8	12.05	7.6	2.95	3.3	2.75	3.1	9.05	3.8	.....
31	5.55	.....	10.9	.....	8.9	.....	3.3	2.65	.....	8.5	.....	.....

NOTE.—Discharge relation Jan. 14 to Mar. 30 affected by ice.

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Daily discharge, in second-feet, of Penobscot River at West Enfield, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9,120	7,440	5,190	40,200	45,100	26,000	6,020	5,890	4,960	5,190	22,000	7,300
2	9,420	8,540	5,190	42,600	40,800	26,000	6,260	5,650	5,190	5,080	19,300	7,710
3	10,000	8,540	4,060	35,600	37,800	24,400	6,140	5,540	5,080	5,650	18,000	7,710
4	13,700	9,120	4,960	33,000	34,200	23,000	5,770	5,890	5,080	6,520	16,400	7,710
5	16,800	8,540	5,650	28,200	28,700	21,100	5,540	6,260	4,960	7,040	14,800	7,710
6	15,200	10,300	5,650	26,500	24,200	17,600	5,300	6,140	4,390	6,390	13,500	7,300
7	15,200	6,910	5,650	24,200	20,400	17,200	5,300	5,890	3,950	6,520	12,800	6,780
8	15,200	6,650	5,420	21,500	20,800	15,600	5,540	5,540	3,840	5,770	12,000	8,980
9	15,200	6,390	5,420	20,200	22,200	14,400	5,540	5,300	3,740	5,540	11,500	12,500
10	15,200	4,960	4,730	17,600	22,200	14,400	5,770	5,080	3,950	5,540	12,300	12,300
11	14,800	4,960	5,420	21,800	21,300	14,400	6,390	4,170	3,950	5,420	17,400	11,800
12	14,800	5,650	5,650	23,200	19,700	12,300	7,840	5,190	3,950	5,190	15,600	9,720
13	16,000	5,420	5,190	26,300	18,200	11,600	7,170	5,190	3,950	5,540	13,700	9,570
14	16,000	4,960	4,960	27,400	17,400	10,300	6,780	5,080	3,840	6,020	12,500	10,000
15	15,600	4,960	5,420	30,100	17,400	9,120	7,040	4,840	3,330	6,780	11,800	8,260
16	13,700	4,500	6,650	33,300	17,600	9,120	7,300	4,620	3,530	7,710	11,100	7,040
17	12,300	4,500	8,540	34,200	17,000	10,200	7,170	4,390	3,950	8,830	10,700	7,300
18	10,300	4,500	10,700	34,400	16,000	11,300	8,260	3,740	3,950	9,120	10,700	8,260
19	10,000	5,190	11,600	36,000	12,300	11,600	10,500	3,950	4,060	8,830	9,880	7,840
20	9,120	4,960	13,700	41,400	12,000	11,000	11,100	4,060	3,840	9,120	10,800	7,170
21	10,700	4,730	19,300	38,400	10,700	10,200	10,500	4,060	3,740	18,800	12,800	7,440
22	12,600	4,730	35,000	35,000	11,000	9,420	9,880	3,950	3,430	31,000	12,300	7,170
23	12,600	4,960	48,600	33,800	12,800	8,260	9,420	4,170	4,960	23,000	11,100	7,170
24	12,600	3,840	50,500	38,000	13,900	8,830	9,120	3,950	12,100	18,600	10,800	6,780
25	10,700	4,730	47,300	39,800	15,200	8,260	8,830	3,630	10,500	17,200	10,800	6,650
26	10,000	5,190	52,400	41,400	15,200	7,440	8,680	4,280	8,540	19,100	9,880	6,390
27	8,260	4,960	50,500	42,300	17,400	6,140	8,400	4,500	7,300	28,200	9,270	6,780
28	9,120	4,960	48,000	43,000	15,800	6,260	6,910	4,730	6,390	33,300	8,540	6,500
29	8,830	.....	48,600	44,200	16,800	5,890	5,890	4,840	5,770	31,000	7,710	6,500
30	8,260	.....	44,200	46,400	21,100	5,300	6,140	4,840	5,650	28,500	7,440	6,500
31	7,440	.....	39,200	.....	27,600	.....	6,140	4,620	.....	25,500	.....	6,500

NOTE.—Discharge determined from a well-defined rating curve. Discharge Jan. 14 to Mar. 30 estimated by comparison with records at Sunkhaze and at Millinocket.

Monthly discharge of Penobscot River at West Enfield, Maine, for 1913.

[Drainage area, 6,600 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	16,800	7,440	12,200	1.85	2.13
February	10,300	3,840	5,900	.894	.93
March	52,400	4,060	19,800	3.00	3.46
April	46,400	17,600	33,300	5.05	5.63
May	45,100	10,700	20,700	3.14	3.62
June	26,000	5,300	12,900	1.95	2.18
July	11,100	5,300	7,310	1.11	1.28
August	6,260	3,630	4,840	.733	.85
September	12,100	3,330	5,060	.767	.86
October	33,300	5,080	13,100	1.98	2.28
November	22,000	7,440	12,600	1.91	2.13
December	13,500	6,390	8,010	1.21	1.40
The year	52,400	3,330	13,000	1.97	26.75

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EAST BRANCH OF PENOBSCOT RIVER AT GRINDSTONE, MAINE.

Location.—At Bangor & Aroostook Railroad bridge half a mile south of railroad station at Grindstone, one-eighth mile above Grindstone Falls, and about 8 miles above the mouth at Medway.

Records available.—October 23, 1902, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—1,100 square miles.

Gage.—Chain.

Channel and control.—Practically permanent; stream confined by abutments of bridge and broken by one pier at ordinary stages; velocity of current medium at moderate and high stages, but sluggish at low water.

Discharge measurements.—Made from railroad bridge.

Winter flow.—Affected by ice.

Regulation.—Several dams are maintained at the outlets of a number of lakes and ponds near the source of the river and regulated in the interests of log driving. During the summer and fall gates are generally left open. The basin of the East Branch since about 1840 includes about 270 square miles of additional territory draining into Chamberlain Lake that formerly drained into the St. John River basin. This diversion is made through what is known as the Telso Canal.

Accuracy.—Discharge relation materially affected by backwater from log jams that form at the station and at Grindstone Falls immediately below, and during the winter months by ice. Results probably fair for moderate and high stages, but uncertain for low water.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:
May 6, 1913: Gage height, 6.30 feet; discharge, 2,050 second-feet.

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, Maine, for 1913.

[G. H. Goddard, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.90	.....	.....	.....	8.40	9.30	5.10	5.60	4.60	4.70	6.88	5.52
2	.....	.....	5.00	9.95	8.35	9.00	5.10	5.70	4.52	4.60	6.70	5.38
3	.....	.....	.....	10.40	8.00	8.30	5.10	5.68	4.55	5.28	6.50	5.30
4	.....	.....	.....	9.85	7.30	7.98	5.10	5.72	4.70	5.25	6.45	5.20
5	6.20	.....	5.00	9.55	6.35	7.60	5.10	5.45	4.62	4.98	6.40	5.12
6	.....	.....	.....	8.75	6.30	7.50	5.00	5.30	4.50	4.90	6.28	5.10
7	.....	.....	.....	7.60	6.82	7.50	4.85	5.28	4.38	4.82	6.60	5.10
8	.....	.....	.....	7.15	7.30	7.35	4.80	5.20	4.28	4.80	7.00	5.75
9	.....	5.40	4.90	7.10	7.10	7.15	4.78	5.10	4.25	4.80	6.75	5.60
10	.....	.....	.....	7.10	7.05	7.05	4.75	5.28	4.20	4.80	6.60	5.80
11	.....	.....	.....	7.00	7.25	7.00	5.50	5.38	4.15	4.75	6.50	5.92
12	.....	5.30	.....	7.00	7.20	7.08	6.00	5.30	4.15	4.72	6.30	5.90
13	.....	.....	5.00	6.90	7.30	7.20	5.80	5.12	4.15	4.75	6.22	5.90
14	.....	.....	.....	6.90	7.40	7.20	5.45	5.10	4.10	4.80	6.20	5.82
15	5.90	.....	.....	7.18	7.32	7.20	5.30	5.00	4.10	5.10	6.08	5.78
16	.....	5.10	.....	7.55	7.30	7.12	5.30	4.92	4.08	5.95	6.00	5.70
17	.....	.....	7.90	7.62	7.20	7.10	5.65	4.88	4.02	6.10	5.92	5.68
18	.....	.....	.....	7.80	7.05	7.00	6.30	4.82	4.00	6.00	5.88	5.55
19	.....	5.05	.....	8.10	6.20	7.00	6.42	4.80	4.10	6.05	5.80	5.48
20	.....	.....	7.50	8.50	5.70	6.95	6.22	4.75	4.25	6.25	5.90	.....
21	.....	.....	.....	8.75	5.70	6.90	6.35	4.70	4.22	9.10	6.10	.....
22	.....	5.00	.....	8.80	6.45	6.85	6.75	4.62	4.20	8.65	6.10	5.30
23	.....	.....	9.80	8.70	7.15	6.68	6.80	4.60	6.35	7.75	5.98	.....
24	.....	.....	.....	8.95	7.42	6.52	6.70	4.72	6.40	7.25	5.80	.....
25	.....	.....	.....	9.38	7.40	6.50	6.72	4.75	5.60	7.10	5.80	.....
26	6.00	5.00	.....	9.20	7.35	6.50	6.80	4.65	5.25	7.40	5.78	5.60
27	.....	.....	9.70	8.85	7.20	6.15	6.60	4.60	5.12	8.30	5.72	.....
28	.....	.....	.....	8.65	7.25	5.70	6.40	4.68	4.98	8.00	5.68	.....
29	6.40	.....	.....	8.60	7.40	5.45	6.35	4.70	4.80	7.65	5.65	.....
30	.....	.....	8.40	8.50	8.60	5.15	6.25	4.65	4.80	7.35	5.60	5.50
31	.....	.....	.....	.....	9.18	.....	5.70	4.62	.....	7.00	.....	.....

NOTE.—Discharge relation probably affected by ice January to March, inclusive, and Dec. 20–31.

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Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, Maine, for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8,700	6,210	8,290	680	1,130	405	455	3,140	1,020
2	9,880	6,100	7,580	680	1,250	360	405	2,790	920
3	11,000	5,330	5,990	680	1,250	382	830	2,450	820
4	9,620	3,890	5,330	680	1,250	455	790	2,360	750
5	8,890	2,200	4,490	680	970	405	620	2,280	680
6	7,000	2,120	4,290	620	830	360	560	2,120	680
7	4,490	2,960	4,290	532	830	315	505	2,620	660
8	3,600	3,890	3,990	505	750	275	505	3,320	1,320
9	3,510	3,510	3,600	505	680	258	505	2,880	1,130
10	3,510	3,420	3,420	480	830	240	505	2,620	1,380
11	3,320	3,800	3,320	1,020	920	225	480	2,450	1,520
12	3,320	3,700	3,510	1,660	830	225	455	2,120	1,520
13	3,140	3,890	3,700	1,380	680	225	480	1,960	1,520
14	3,140	4,090	3,700	970	680	210	505	1,960	1,380
15	3,700	3,890	3,700	830	620	210	680	1,810	1,380
16	4,390	3,890	3,510	830	560	210	1,590	1,660	1,250
17	4,490	3,700	3,510	1,190	560	185	1,810	1,520	1,250
18	4,910	3,420	3,320	2,120	505	185	1,660	1,520	1,080
19	5,550	1,960	3,320	2,280	505	210	1,740	1,380	1,020
20	6,430	1,250	3,230	1,960	480	258	2,040	1,520	.....
21	7,000	1,250	3,140	2,200	455	240	7,810	1,810	.....
22	7,120	2,360	3,050	2,880	405	240	6,780	1,810	.....
23	6,890	3,600	2,790	2,960	405	2,200	4,800	1,660	.....
24	7,460	4,090	2,450	2,790	455	2,280	3,800	1,380	.....
25	8,530	4,090	2,450	2,790	480	1,130	3,510	1,380	.....
26	8,050	3,990	2,450	2,960	430	790	4,090	1,380	.....
27	7,240	3,700	1,890	2,620	405	680	5,990	1,250	.....
28	6,780	3,800	1,250	2,280	455	620	5,330	1,250	.....
29	6,660	4,090	970	2,200	455	505	4,600	1,190	.....
30	6,430	6,660	715	2,040	430	505	3,990	1,130	.....
31	.....	8,050	.....	1,250	405	.....	3,320	.....	.....

NOTE.—Discharge determined from a rating curve fairly well defined between 400 and 10,000 second-feet. Mean discharge Dec. 20–31 estimated at 800 second-feet. Data insufficient for estimates of flow January to March.

Monthly discharge of East Branch of Penobscot River at Grindstone, Maine, for 1913.

[Drainage area, 1,100 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
April	11,000	3,140	6,160	5.60	6.25
May	8,050	1,250	3,840	3.49	4.02
June	8,290	715	3,570	3.24	3.62
July	2,960	480	1,520	1.38	1.59
August	1,250	405	674	.613	.71
September	2,280	185	493	.448	.50
October	6,780	405	2,300	2.09	2.41
November	3,320	1,130	1,960	1.78	1.99
December	1,520	.....	997	.906	1.04

MATTAWAMKEAG RIVER AT MATTAWAMKEAG, MAINE.

Location.—At Maine Central Railroad bridge at the village of Mattawamkeag, half a mile above the mouth of the river.

Records available.—August 26, 1902, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

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Drainage area.—1,500 square miles.

Gage.—Chain.

Channel and control.—Practically permanent; channel at gage section broken by two bridge piers.

Discharge measurements.—Made from the bridge, which is slightly oblique to the current; low-water measurements made by wading at a point about 1 mile above the station.

Winter flow.—Affected by ice.

Regulation.—Dams are maintained at the outlets of several large lakes and ponds, but the stored water is used only for log driving.

Accuracy.—Discharge relation at times affected by backwater from log jams that form in the log-driving season and during the winter months by ice.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Mattawamkeag River at Mattawamkeag, Maine, during 1913.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 7	6.95	5,180
28	6.38	3,800

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, Maine, for 1913.

[W. T. Mincher, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	12.0	11.15	8.2	4.2	4.4	3.45	4.4	9.3	6.5
2	.....	10.1	9.7	12.0	10.25	8.15	4.3	4.3	3.75	4.4	9.15	6.45
3	.....	.....	.....	12.0	8.55	7.85	4.25	4.2	3.85	4.3	8.9	6.4
4	.....	.....	.....	12.0	8.15	7.55	4.1	4.45	3.80	4.2	8.8	6.4
5	.....	.....	.....	12.1	7.85	7.25	4.1	4.7	3.80	4.35	8.55	6.4
6	.....	.....	.....	11.85	7.3	7.0	4.1	4.85	3.7	4.4	8.25	6.4
7	.....	.....	.....	10.55	7.0	6.8	4.05	4.9	3.6	4.5	8.05	6.4
8	.....	.....	.....	10.35	6.9	6.7	3.85	4.8	3.5	4.5	7.85	6.4
9	.....	9.5	9.9	10.05	6.7	6.5	3.7	4.8	3.35	4.5	7.45	6.35
10	.....	.....	.....	9.75	6.85	6.5	3.75	4.7	3.3	4.5	7.25	6.85
11	.....	.....	.....	9.7	6.9	6.25	3.8	4.55	3.3	4.4	7.6	7.55
12	.....	.....	.....	9.8	6.8	5.7	3.7	4.35	3.2	4.35	7.6	7.3
13	.....	.....	.....	9.95	6.7	4.6	3.9	4.15	3.1	4.6	7.35	7.15
14	.....	.....	.....	10.3	6.6	4.55	4.35	4.0	3.2	4.7	7.15	7.0
15	.....	.....	.....	10.65	6.5	4.25	4.3	3.9	3.3	4.9	7.2	7.0
16	.....	9.5	9.8	10.7	6.4	4.35	4.2	3.8	3.4	5.25	7.2	6.9
17	.....	.....	.....	10.8	6.3	5.15	4.2	3.8	3.4	5.45	7.3	6.8
18	.....	.....	.....	10.7	6.2	5.4	4.35	3.8	3.4	5.5	7.2	6.65
19	.....	.....	.....	10.8	5.95	5.4	4.65	3.7	3.5	5.6	7.2	6.4
20	.....	.....	.....	10.8	5.65	5.4	4.7	3.6	3.5	5.8	7.2	6.3
21	.....	.....	.....	10.8	5.7	5.3	4.7	3.6	3.5	5.8	7.2	6.0
22	.....	.....	.....	11.05	5.7	5.15	4.7	3.5	3.75	.....	7.1	5.8
23	.....	9.4	15.1	11.25	5.85	4.85	4.7	3.55	4.5	.....	7.0	6.2
24	.....	.....	11.65	11.45	5.85	4.7	4.7	3.7	4.95	.....	6.9	6.2
25	.....	.....	11.85	11.6	5.7	4.6	4.7	3.55	5.1	.....	6.9	6.2
26	10.0	.....	11.9	11.6	5.85	4.5	4.7	3.2	5.1	.....	6.9	6.2
27	.....	.....	12.0	11.9	6.2	4.5	4.7	3.1	5.1	.....	6.9	6.2
28	.....	.....	12.1	12.25	6.3	4.5	4.7	3.15	4.85	.....	6.9	6.2
29	.....	.....	11.95	12.6	6.9	4.35	4.6	3.35	4.65	.....	6.8	.....
30	.....	.....	11.9	11.95	7.5	4.2	4.5	3.55	4.5	9.4	6.7	.....
31	.....	.....	11.9	.....	8.0	.....	4.5	3.45	.....	9.35	.....	.....

NOTE.—Discharge relation Jan. 1 to Mar. 22 seriously affected by ice.

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Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, Maine, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	19,000	16,200	7,860	818	1,000	354	1,000	10,800	4,090
3	.....	19,000	13,400	7,730	906	906	498	1,000	10,400	4,000
2	.....	19,000	8,770	6,980	862	818	558	906	9,690	3,900
4	.....	19,000	7,730	6,250	736	1,050	525	818	9,420	3,900
5	.....	19,300	6,980	5,600	736	1,320	525	953	8,770	3,900
6	.....	18,500	5,700	5,080	736	1,500	470	1,000	7,990	3,900
7	.....	14,400	5,080	4,680	698	1,560	420	1,100	7,480	3,900
8	.....	13,800	4,880	4,480	558	1,440	375	1,100	6,980	3,900
9	.....	12,900	4,480	4,090	470	1,440	314	1,100	6,030	3,800
10	.....	12,000	4,780	4,090	498	1,320	295	1,100	5,600	4,750
11	.....	11,900	4,880	3,620	525	1,160	295	1,000	6,360	6,250
12	.....	12,200	4,680	2,660	470	953	258	953	6,360	5,700
13	.....	12,600	4,480	1,210	590	777	223	1,210	5,810	5,380
14	.....	13,600	4,280	1,160	953	660	258	1,320	5,380	5,080
15	.....	14,700	4,090	862	906	590	295	1,560	5,490	5,080
16	.....	14,800	3,900	953	818	525	334	2,020	5,490	4,880
17	3,300	15,100	3,710	1,880	818	525	334	2,290	5,700	4,680
18	5,000	14,800	3,520	2,220	953	525	334	2,360	5,490	4,380
19	7,000	15,100	3,070	2,220	1,260	470	375	2,500	5,490	3,900
20	9,000	15,100	2,580	2,220	1,320	420	375	2,820	5,490	3,710
21	11,000	15,100	2,660	2,080	1,320	420	375	2,820	5,490	3,160
22	13,000	15,900	2,660	1,880	1,320	375	498	3,840	5,280	2,820
23	18,000	16,600	2,900	1,500	1,320	398	1,100	4,860	5,080	3,520
24	17,800	17,200	2,900	1,320	1,320	470	1,620	5,880	4,880	3,520
25	18,500	17,700	2,660	1,210	1,320	398	1,820	6,900	4,880	3,520
26	18,700	17,700	2,900	1,100	1,320	258	1,820	7,920	4,880	3,520
27	19,000	18,700	3,520	1,100	1,320	223	1,820	8,940	4,880	3,520
28	19,300	19,800	3,710	1,100	1,320	240	1,500	9,960	4,880	3,520
29	18,800	21,000	4,880	953	1,210	314	1,260	11,000	4,680	3,520
30	18,700	18,800	6,140	818	1,100	398	1,100	11,000	4,480	3,520
31	18,700	.....	7,350	.....	1,100	354	.....	10,900	.....	3,520

NOTE.—Discharge determined from a well-defined rating curve. Winter discharge estimated by comparison with adjacent streams, as follows: January, mean discharge, 3,450 second-feet; February, 960 second-feet; Mar. 1–16, 950 second-feet. Discharge Mar. 17–22, estimated; Oct. 22–29, interpolated.

Monthly discharge of Mattawamkeag River at Mattawamkeag, Maine, for 1913.

[Drainage area, 1,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	.....	.....	3,450	2.30	2.65
February	.....	.....	960	.640	.67
March	.....	.....	7,450	4.97	5.73
April	21,000	11,900	16,200	10.8	12.06
May	16,200	2,580	5,140	3.43	3.95
June	7,860	818	2,960	1.97	2.20
July	1,320	470	955	.636	.73
August	1,560	223	736	.490	.56
September	1,820	223	678	.452	.50
October	11,000	818	3,620	2.41	2.78
November	10,800	4,480	6,320	4.21	4.70
December	6,250	2,820	4,090	2.73	3.15
The year	21,000	223	4,380	2.92	39.67

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PISCATAQUIS RIVER NEAR FOXCROFT, MAINE.

Location.—At Low's highway bridge, about halfway between Guilford and Foxcroft, three-fourths of a mile above the mouth of Black Stream and 3 miles below Mill Stream.

Records available.—August 17, 1902, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—286 square miles.

Gage.—Staff attached to left abutment of bridge.

Channel and control.—Practically permanent; banks high and overflowed only during extreme floods.

Discharge measurements.—At medium and high stages made from the bridge at low stages made by wading either above or below the bridge, where the bed is of fine gravel but the velocity is greater than at the bridge.

Winter flow.—Affected by ice during some years.

Artificial regulation.—The stream is used to develop power at several manufacturing plants above the station.

Accuracy.—Discharge relation at low stages considerably affected by the irregular use of water at the mills; during some winters it is also affected by ice; little if any affected by backwater from log jams, as little log driving is now done on the river.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:

May 26, 1913: Gage height, 3.20 feet; discharge, 504 second-feet.

Daily gage height, in feet, of Piscataquis River near Foxcroft, Maine, for 1913.

[A. F. D. Harlow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	2.65	2.25	8.7	4.35	3.15	1.95	1.95	2.1	2.3	3.65	2.8
2	2.9	2.65	2.25	6.1	4.15	3.2	1.95	1.95	2.1	2.35	3.5	2.75
3	2.9	2.65	2.2	4.95	4.15	3.2	1.95	1.95	2.1	2.6	3.45	2.75
4	3.15	2.9	2.3	4.5	4.45	3.2	1.95	2.05	2.1	2.7	3.45	2.9
5	3.15	3.1	2.4	4.35	4.05	2.9	1.95	2.25	2.2	2.7	3.35	2.9
6	3.15	3.1	2.4	4.2	4.05	2.8	1.9	2.25	2.35	2.7	3.25	2.8
7	3.15	3.25	2.6	4.1	3.7	2.7	2.1	2.05	2.25	2.7	3.2	2.5
8	3.15	3.0	2.7	3.95	3.1	2.0	2.25	1.9	2.2	2.55	3.25	4.15
9	3.35	2.9	2.55	3.95	3.1	2.25	2.25	1.9	2.2	2.55	4.0	3.85
10	3.35	3.15	2.55	3.95	3.1	2.25	2.3	1.9	2.15	2.45	6.15	3.75
11	3.6	3.25	2.55	3.8	3.1	2.35	2.45	2.0	2.15	2.25	5.3	3.6
12	3.6	3.4	2.45	4.5	3.0	2.45	2.45	2.3	2.15	2.05	4.8	3.4
13	3.6	3.2	2.45	4.5	2.75	2.45	2.65	2.25	2.1	2.2	4.4	3.2
14	3.65	3.1	2.55	4.8	2.65	2.45	2.65	2.2	2.2	2.25	4.25	3.15
15	3.6	2.8	3.1	5.35	2.6	2.45	2.65	2.15	2.2	2.25	4.0	3.15
16	3.25	2.7	3.5	5.6	2.6	2.45	2.65	2.15	2.0	2.8	3.8	3.05
17	3.25	3.25	3.9	5.4	2.4	2.45	2.7	2.35	1.85	2.95	3.75	3.15
18	3.2	3.25	3.8	5.4	2.4	2.45	2.7	2.35	1.85	2.95	3.7	3.2
19	3.4	2.95	3.7	5.55	2.5	2.5	2.75	2.35	1.85	2.95	3.65	3.3
20	3.9	2.65	3.6	5.95	2.5	2.4	2.8	2.35	1.85	4.5	3.9	3.3
21	3.8	2.45	4.4	4.7	2.35	2.25	2.65	2.2	1.85	8.25	3.95	2.95
22	3.65	2.55	8.2	4.3	2.9	2.1	2.65	2.2	2.2	6.35	3.9	2.8
23	3.6	3.0	7.5	5.25	3.25	2.1	2.65	2.05	4.25	4.3	3.7	2.25
24	3.2	3.05	5.75	5.5	3.4	2.05	2.6	2.05	3.9	3.85	3.65	2.15
25	3.0	3.05	6.7	5.5	3.2	2.0	2.6	2.25	3.55	5.8	3.65	2.4
26	2.95	2.9	8.15	5.65	3.15	1.95	2.55	2.65	3.05	5.8	3.3	2.55
27	2.95	2.8	7.9	4.9	2.95	1.95	2.5	2.8	2.35	5.8	3.1	2.55
28	3.15	2.55	5.5	4.65	3.0	1.85	2.35	2.7	2.35	5.10	3.0	3.1
29	3.4	.....	4.8	4.35	3.15	1.85	2.2	2.45	2.2	4.95	3.0	3.15
30	3.1	.....	4.4	4.35	3.15	1.85	2.0	2.2	2.2	4.55	2.9	3.15
31	2.9	.....	4.8	.....	3.15	.....	1.95	2.1	.....	4.1	.....	3.2

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Daily discharge, in second-feet, of Piscataquis River near Foxcroft, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	220	244	111	9,240	1,560	536	58	58	81	123	898	374
2	374	244	111	4,150	1,350	569	58	58	81	136	782	293
3	374	244	100	2,280	1,350	569	58	58	81	220	746	293
4	536	374	123	1,720	1,670	569	58	72	81	267	746	374
5	536	502	148	1,560	1,260	374	58	112	100	267	674	374
6	536	502	148	1,400	1,260	318	51	112	136	267	604	318
7	536	604	220	1,300	938	267	81	72	112	267	569	180
8	536	437	267	1,160	502	64	112	51	100	200	604	1,350
9	674	374	200	1,160	502	112	112	51	100	200	1,210	1,070
10	674	536	200	1,160	502	112	123	51	90	164	4,240	980
11	858	604	200	1,020	502	136	164	64	90	112	2,780	855
12	858	709	164	1,720	437	164	164	123	90	72	2,080	709
13	858	569	164	1,720	292	164	244	112	81	100	1,620	569
14	898	502	200	2,080	244	164	244	100	100	112	1,460	536
15	858	318	502	2,860	220	164	244	90	100	112	1,210	536
16	604	267	782	3,260	220	164	244	90	64	318	1,020	470
17	604	604	1,110	2,940	148	164	267	136	46	406	980	536
18	569	604	1,020	2,940	148	164	267	136	46	406	938	569
19	709	406	938	3,180	180	180	292	136	46	406	898	635
20	1,110	244	858	3,880	180	148	318	136	46	1,720	1,110	635
21	1,020	164	1,620	1,960	136	112	244	100	46	8,320	1,160	406
22	898	200	8,220	1,510	374	81	244	100	100	4,610	1,110	318
23	858	437	6,820	2,710	604	81	244	72	1,460	1,510	938	112
24	569	470	3,520	3,100	709	72	220	72	1,110	1,070	898	90
25	437	470	5,270	3,100	569	64	220	112	820	3,610	898	148
26	406	374	8,120	3,350	536	58	200	244	470	3,610	638	200
27	406	318	7,610	2,220	406	58	180	318	136	3,610	502	200
28	536	200	3,100	1,900	437	46	136	267	136	2,560	437	502
29	709	.....	2,080	1,560	536	46	100	164	100	2,280	437	536
30	502	.....	1,620	1,560	536	46	64	100	100	1,780	374	536
31	374	.....	2,080	.....	536	.....	58	81	.....	1,300	.....	569

NOTE.—Discharge determined from a rating curve well defined between 20 and 4,000 second-feet.

Monthly discharge of Piscataquis River near Foxcroft, Maine, for 1913.

[Drainage area, 286 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	1,110	220	633	2.21	2.55
February	709	164	411	1.44	1.50
March	8,220	100	1,860	6.50	7.49
April	9,240	1,020	2,460	8.60	9.60
May	1,670	136	608	2.12	2.44
June	569	46	192	.672	.75
July	318	51	165	.578	.67
August	318	51	111	.389	.45
September	1,460	46	205	.718	.80
October	8,320	72	1,290	4.51	5.20
November	4,240	374	1,080	3.78	4.22
December	1,350	90	493	1.72	1.98
The year	9,240	46	792	2.77	37.65

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KENDUSKEAG STREAM NEAR BANGOR, MAINE.

Location.—At highway bridge at Sixmile Falls, about 6 miles northwest of Bangor.
Records available.—September 15, 1908, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.
Drainage area.—191 square miles.
Gage.—Chain.
Channel and control.—Practically permanent; broken by one pier; banks high and not subject to overflow.
Discharge measurements.—Made from bridge.
Winter flow.—Affected by ice.
Artificial control.—A number of years ago an artificial cut was made for log driving through a low divide between Souadabscook Stream and Black Stream, the latter a tributary to the Kenduskeag, entering about 7 miles above the gaging station. During high stages of the Souadabscook part of its waters finds its way through the artificial cut into the Kenduskeag; at low stages of the Souadabscook all the flow continues down its own channel. Black Stream probably sends its waters only to the Kenduskeag.
Accuracy.—More measurements are needed at high stages.
Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:
May 5, 1913: Gage height, 2.80 feet; discharge, 224 second-feet.

Daily gage height, in feet, of Kenduskeag Stream near Bangor, Maine, for 1913.

[Fred Cort, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.05	4.2	.....	6.15	4.2	4.1	2.2	1.75	1.7	1.85	3.8	3.6
2	5.5	4.35	2.7	6.6	3.65	4.1	2.1	1.95	1.8	1.85	3.5	3.65
3	6.2	4.5	.....	6.6	3.5	3.75	2.0	2.1	1.8	1.9	3.45	3.55
4	6.55	4.5	.....	6.1	3.4	3.4	1.95	2.05	1.75	2.0	3.6	3.4
5	6.35	3.95	.....	5.9	2.95	3.05	2.0	1.95	1.8	2.05	3.7	3.25
6	5.55	3.8	.....	5.6	2.85	2.7	1.9	1.85	1.75	2.1	3.75	3.45
7	4.95	3.55	.....	5.6	2.85	2.6	1.75	1.9	1.7	2.2	3.65	3.5
8	4.85	3.4	.....	5.35	2.8	2.4	1.65	1.85	1.8	2.25	3.45	3.6
9	4.75	3.25	2.8	4.9	2.7	2.7	1.95	1.9	1.7	2.35	3.3	3.65
10	4.65	.....	.....	4.75	2.75	2.75	2.05	1.8	1.7	2.35	3.3	3.45
11	4.7	.....	.....	4.55	2.65	2.65	2.0	1.85	1.6	2.2	3.45	3.35
12	4.7	.....	.....	5.05	2.8	2.55	1.9	1.85	1.6	2.2	3.5	3.55
13	4.75	.....	.....	5.45	2.7	2.45	1.85	1.8	1.65	2.45	3.6	3.7
14	4.75	.....	.....	5.7	2.55	2.4	1.95	1.8	1.65	2.65	3.45	3.6
15	4.8	.....	.....	5.6	2.5	2.3	1.9	1.7	1.75	2.8	3.5	3.7
16	4.9	.....	7.7	5.6	2.55	2.2	1.9	1.7	1.8	2.9	3.6	3.75
17	4.95	.....	8.1	5.55	2.35	2.1	1.9	1.6	1.75	2.8	3.55	3.8
18	5.15	2.8	7.8	5.6	2.35	2.05	1.95	1.7	1.75	2.7	3.6	3.75
19	5.45	.....	7.3	5.55	2.3	2.25	2.15	1.7	1.85	2.65	3.7	3.7
20	5.55	.....	7.95	5.5	2.35	2.3	2.2	1.7	1.85	2.7	3.7	3.55
21	5.45	.....	8.05	5.5	2.25	2.3	2.25	1.6	1.8	3.05	3.8	3.45
22	5.35	.....	7.95	5.3	2.3	2.2	2.1	1.6	1.85	3.8	3.65	3.3
23	5.35	2.8	7.8	5.15	2.9	2.05	2.15	1.7	1.85	4.2	3.6	3.2
24	5.15	.....	7.9	5.0	3.3	1.95	2.2	1.6	1.9	4.7	3.45	3.2
25	5.0	.....	7.75	4.85	3.65	2.1	2.05	1.55	1.9	5.05	3.55	3.2
26	4.75	.....	7.85	4.9	3.7	2.25	1.9	1.65	1.95	5.25	3.5	3.15
27	4.65	.....	7.5	5.0	3.55	2.3	1.85	1.7	2.0	5.75	3.4	3.05
28	4.15	.....	6.8	4.8	3.3	2.35	1.85	1.8	1.9	5.6	3.4	2.9
29	4.2	.....	6.3	4.65	3.15	2.25	1.8	1.65	1.85	5.1	3.45	2.85
30	4.25	.....	5.9	4.55	3.7	2.2	1.7	1.7	1.7	4.55	3.55	2.85
31	4.25	.....	5.6	.....	4.2	.....	1.75	1.7	.....	4.15	.....	2.8

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Daily discharge, in second-feet, of Kenduskeag Stream near Bangor, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,150	700	200	1,900	700	655	102	40	34	51	538	465
2	1,440	770	199	2,260	483	655	86	64	45	51	431	483
3	1,940	845	200	2,260	431	520	71	86	45	57	414	448
4	2,220	845	200	1,860	398	398	64	78	40	71	465	398
5	2,060	596	200	1,720	262	290	71	64	45	78	501	339
6	1,470	538	200	1,500	236	199	57	51	40	86	520	414
7	1,090	448	200	1,500	236	177	40	57	34	102	483	431
8	1,030	398	200	1,340	223	137	30	51	45	110	414	465
9	978	350	223	1,060	199	199	64	57	34	128	366	483
10	922	335	220	978	211	211	78	45	34	128	366	414
11	950	320	220	870	188	188	71	51	25	102	414	262
12	950	305	250	1,150	223	166	57	51	25	102	431	448
13	978	290	250	1,400	199	146	51	45	30	146	465	501
14	978	275	300	1,580	166	137	64	45	30	188	414	465
15	1,000	260	300	1,500	156	119	57	34	40	223	431	501
16	1,060	245	3,230	1,500	166	102	57	34	45	249	465	520
17	1,090	230	3,590	1,470	128	86	57	25	40	223	448	538
18	1,210	223	3,320	1,500	128	78	64	34	40	199	465	520
19	1,400	200	2,870	1,470	119	110	94	34	51	188	501	501
20	1,470	200	3,460	1,440	128	119	102	34	51	199	501	448
21	1,400	200	3,540	1,440	110	119	110	25	45	290	538	414
22	1,340	200	3,460	1,300	119	102	86	25	51	538	483	366
23	1,340	223	3,320	1,210	249	78	94	34	51	700	465	335
24	1,210	200	3,410	1,120	366	64	102	25	57	950	414	335
25	1,120	200	3,280	1,030	483	86	78	22	57	1,150	448	335
26	978	200	3,360	1,060	501	110	57	30	64	1,270	431	320
27	922	200	3,050	1,120	448	119	51	34	71	1,610	398	290
28	678	200	2,430	1,000	366	128	51	45	57	1,500	398	269
29	700	.....	2,020	922	320	110	45	30	51	1,180	414	288
30	722	.....	1,720	870	501	102	34	34	34	870	448	236
31	722	.....	1,500	.....	700	.....	40	34	.....	678	.....	223

NOTE.—Discharge determined from a rating curve well defined between 10 and 3,000 second-feet. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Kenduskeag Stream near Bangor, Maine, for 1913.

[Drainage area, 191 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	2,220	678	1,180	6.18	7.13
February	845	200	357	1.87	1.95
March	3,590	199	1,640	8.59	9.90
April	2,260	870	1,380	7.22	8.06
May	700	110	295	1.54	1.78
June	655	64	190	.995	1.11
July	110	30	67	.351	.40
August	86	22	42	.220	.25
September	71	25	44	.230	.26
October	1,610	51	432	2.26	2.61
November	538	366	449	2.35	2.62
December	538	223	404	2.12	2.44
The year	3,590	22	542	2.84	38.39

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KENNEBEC RIVER BASIN.

MOOSEHEAD LAKE AT EAST OUTLET, MAINE.

Location.—At the wharf at the east outlet of the lake, about 8 miles from Kineo.

Records available.—April 1, 1895, to December 31, 1913.

Drainage area.—1,240 square miles.

Gage.—Staff, at end of boat landing; two datums have been used at the east outlet; the original datum is at elevation 1,011.30 feet above mean sea level and approximately 10 feet below the sills of the outlet gates; gage is read to this datum; the second, to which all gage readings published to and including 1911 have been referred, is 10 feet higher; that is, the zero is at the sill of the gates. It is believed that low water may go below the sill of the gates (zero of second datum) and therefore gage heights in this report are published as read, that is, to the original datum 1,011.30 feet above mean sea level.

Regulation.—The lake is regulated to a capacity of 23,735,000,000 cubic feet. The dam at the east outlet is controlled by 35 gates; 15 old gates are at gage height 10 feet (original datum) and 20 gates at sill-gage height 8 feet (original datum). At extreme low stages the flow from the lake is controlled not by the gates but by a bar above the dam at an approximate gage height of 9 feet (original datum). The records show only fluctuations in the level of the lake, and are used in the studies of regulation of the lake and in computing the natural flow of the Kennebec at The Forks station.

Storage capacity.—Approximately equal to a discharge of 124 second-feet for one month (30 days) for each one-tenth foot of depth over the surface of Moosehead Lake.

Cooperation.—Record kept and furnished for publication by the Hollingsworth & Whitney Co.

Daily gage height, in feet, of Moosehead Lake at east outlet, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								15.65	13.85	12.8		15.05
2	16.75			16.6	17.5	17.5						
3	16.8	16.35	15.5				17.1		13.75	12.65	13.9	15.0
4				16.90		17.5		15.6				
5		16.3	15.45		17.5		17.05		13.65		14.0	15.05
6	16.8					17.5		15.4		12.5		
7		16.2	15.4	17.1			16.9				14.0	
8					17.5				13.45	12.6		15.15
9				17.0	17.5	17.5	16.8					
10	16.65	16.2	15.1						13.4	12.65	14.2	15.3
11				17.05		17.5	16.75	15.2				
12		16.1	15.05		17.45				13.2		14.3	15.35
13	16.6					17.3		15.1		12.6		
14		15.95	15.05	17.1	17.4		16.7					
15	16.5											15.4
16			14.9	17.15	17.3	17.3	16.5			12.65		
17	16.55	15.95					16.4		13.1	12.6	14.5	
18				17.15		17.3		14.7				
19		15.9	14.85		17.3				12.9		14.55	15.35
20	16.5					17.25		14.5		12.7		
21			14.85	17.35	17.2		16.3				14.7	
22	16.45	15.8						14.2	12.8	12.9		15.3
23				17.3	17.2	17.2	16.15				14.8	
24	16.5	15.75	15.2						13.0	13.1		15.45
25				17.4		17.1	16.1	14.1				
26		15.65	15.45		17.2				13.0		14.95	15.45
27	16.5					17.05		14.05		13.35		
28		15.6	15.7		17.2		15.9				14.9	
29	16.5			17.5				14.0	12.9	13.55		15.4
30				17.5	17.5	17.0	15.8					
31			16.15							13.85		15.4

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KENNEBEC RIVER AT THE FORKS, MAINE.

Location.—At a wooden highway bridge about 2,000 feet above Dead River.

Records available.—September 28, 1901, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—1,570 square miles.

Gages.—Chain on bridge, a vertical staff on timber retaining wall on left bank 75 feet above the bridge, and an automatic gage on the left abutment. Automatic gage set to read the same as chain gage in low water, but gives lower readings than the chain gage in high water.

Channel and control.—Practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Usually somewhat affected by ice, but not seriously affected during 1913.

Regulation.—Flow regulated by storage in Moosehead Lake. During May, June, and July the operation of Indian Pond for log driving causes great diurnal fluctuation.

Natural flow.—Records of the observed discharge at The Forks have been reduced to natural flow by adding or subtracting the amount of water stored in or released from Moosehead Lake from January 1, 1902, to December 31, 1913.

Accuracy.—Results fair.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Kennebec River at The Forks, Maine, during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 7	C. C. Babb	a 5.63	7,210
8	G. C. Danforth	a 5.57	6,900

a Reading on chain gage.

Daily gage height, in feet, of Kennebec River at The Forks, Maine, for 1913.

[W. S. Young and A. B. Durgin, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	Nov.	Dec.	Day.	Jan.	Feb.	Mar.	Apr.	Nov.	Dec.
1	2.50	2.90	3.04	3.58	.....	1.21	16	2.86	3.10	2.40	.....	.....	.....
2	2.49	.....	3.04	4.42	.....	1.34	17	2.84	3.08	2.45	.....	.....	1.89
3	2.52	2.90	3.04	4.30	.....	1.40	18	2.84	3.08	2.45	.....	.....	1.90
4	3.00	2.90	3.06	4.12	.....	1.69	19	2.85	3.08	2.42	.....	1.10	1.95
5	.....	2.90	3.06	4.30	.....	1.65	20	2.96	3.08	2.15	.....	1.21	2.15
6	3.00	2.90	3.08	5.32	.....	.....	21	2.96	3.07	2.25	.....	1.23	2.25
7	3.00	2.90	3.80	.....	.....	.....	22	2.97	3.07	2.46	.....	1.19	2.20
8	3.00	2.91	3.84	.....	.....	.....	23	2.50	3.07	2.54	.....	1.26	2.10
9	2.97	2.92	3.86	.....	.....	.....	24	2.52	3.04	2.84	.....	1.30	2.25
10	2.95	2.92	3.86	.....	.....	.....	25	2.54	3.04	3.08	.....	1.23	2.25
11	2.95	2.92	3.86	.....	.....	1.85	26	.....	3.04	3.47	.....	1.18	2.20
12	.....	2.92	2.80	.....	.....	1.62	27	2.60	3.04	3.62	.....	1.15	2.30
13	2.92	2.93	2.70	.....	.....	.....	28	2.64	3.04	3.90	.....	1.22	2.30
14	2.90	2.94	2.50	.....	.....	.....	29	2.70	.....	3.52	.....	1.35	2.98
15	2.88	2.98	2.36	.....	.....	.....	30	2.74	.....	3.26	.....	1.15	2.99
							31	2.74	.....	3.12	.....	.....	2.99

NOTE.—Gage heights observed on chain gage.

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Daily discharge, in second-feet, of Kennebec River at The Forks, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,850	2,330	2,520	3,300	10,100	5,280	2,450	2,980	1,910	1,360	918	707
2	1,840	2,330	2,520	4,730	5,680	6,110	2,680	2,930	1,910	1,290	776	798
3	1,870	2,330	2,520	4,500	6,240	6,140	2,880	2,880	1,910	1,090	667	840
4	2,460	2,330	2,530	4,180	6,530	5,530	3,080	2,610	1,910	866	635	1,060
5	2,460	2,330	2,530	4,500	6,430	5,110	3,280	2,640	1,840	729	635	1,030
6	2,460	2,330	2,570	6,520	6,090	3,220	3,440	2,630	1,740	700	602	1,060
7	2,460	2,330	3,640	7,190	6,330	3,690	3,350	2,750	1,700	694	602	1,090
8	2,460	2,340	3,710	7,030	5,940	3,290	3,120	2,540	1,960	646	602	1,120
9	2,420	2,360	3,740	6,270	4,330	4,650	3,190	2,390	2,040	635	613	1,150
10	2,400	2,360	3,740	4,810	3,980	3,950	3,250	4,080	1,930	635	1,600	1,180
11	2,400	2,360	3,740	4,030	3,440	3,220	3,390	2,500	1,880	618	2,200	1,200
12	2,380	2,360	2,200	4,030	3,440	3,300	3,600	2,340	1,810	681	1,800	1,010
13	2,360	2,370	2,080	4,160	3,360	3,430	3,800	2,280	1,860	1,030	1,200	990
14	2,330	2,380	1,850	4,540	3,350	3,360	3,540	2,770	1,850	862	1,000	970
15	2,300	2,430	1,700	5,760	3,310	3,290	3,510	2,990	1,850	667	900	950
16	2,280	2,600	1,740	7,580	3,010	3,220	3,730	3,300	1,790	624	860	930
17	2,250	2,570	1,800	8,960	2,740	3,150	3,540	3,470	1,750	602	800	915
18	2,250	2,570	1,800	7,800	2,910	3,080	3,480	3,410	1,700	681	660	1,240
19	2,400	2,570	1,760	6,420	3,080	3,000	3,420	3,230	1,680	1,130	635	1,260
20	2,410	2,570	1,480	7,330	2,750	2,920	3,370	2,900	1,650	1,470	707	1,480
21	2,410	2,540	1,580	8,330	3,120	2,840	3,510	2,500	1,620	1,660	721	1,580
22	2,420	2,540	1,810	9,150	2,900	2,760	3,360	2,070	1,700	1,610	694	1,530
23	1,850	2,540	1,900	8,280	3,080	2,680	3,140	1,940	1,900	1,240	742	1,430
24	1,870	2,520	2,250	7,960	3,390	2,600	3,310	1,910	902	999	770	1,580
25	1,890	2,520	2,570	10,500	3,780	2,520	3,860	1,910	635	944	721	1,580
26	1,920	2,520	3,120	11,500	3,650	2,440	3,620	1,860	602	1,360	687	1,530
27	1,960	2,520	3,360	12,400	3,350	2,390	3,450	2,040	602	2,230	668	1,630
28	2,010	2,520	3,810	12,400	2,830	2,450	3,300	2,180	646	2,240	714	1,630
29	2,080	.....	3,200	11,900	3,670	2,470	3,160	2,240	1,160	1,920	805	2,330
30	2,130	.....	2,820	11,400	2,550	2,260	3,100	2,110	1,310	1,469	668	2,330
31	2,130	.....	2,620	.....	3,900	.....	3,040	1,940	.....	1,090	.....	2,330

NOTE.—Discharge Jan. 1 to Apr. 6, and Nov. 19 to Dec. 31, determined from a well-defined rating curve applied to the readings of the chain gage. Discharge Apr. 7 to Nov. 18 determined as the mean of discharges at two-hour intervals as indicated by the records from the automatic gage.

Monthly discharge of Kennebec River at The Forks, Maine, for 1902 to 1913.

[Drainage area, 1,570 square miles.]

Month.	Mean discharge in second-feet.			Run-off (depth in inches on drainage area).	Month.	Mean discharge in second-feet.			Run-off (depth in inches on drainage area).
	As observed.	As corrected for storage.	Per square mile.			As observed.	As corrected for storage.	Per square mile.	
1902.					1904.				
January	1,890	2,230	1.42	1.64	January	485	485	0.309	0.36
February	1,850	1,550	.987	1.03	February	455	455	.290	.31
March	3,280	4,440	2.83	3.26	March	1,850	1,850	1.18	1.36
April	10,000	13,800	8.82	9.84	April	7,320	7,320	4.66	5.20
May	9,500	9,620	6.13	7.07	May	5,060	11,500	7.34	8.46
June	9,600	9,150	5.83	6.50	June	6,510	5,150	3.28	3.66
July	6,060	3,960	2.52	2.90	July	5,650	4,580	2.92	3.37
August	2,930	1,850	1.18	1.36	August	2,970	1,300	.828	.95
September	1,630	1,510	.962	1.07	September	2,120	2,610	1.66	1.85
October	1,430	1,430	.911	1.05	October	1,560	1,130	.720	.83
November	645	2,730	1.74	1.94	November	1,330	1,140	.726	.81
December	2,140	1,960	1.25	1.44	December	1,330	880	.560	.65
The year	4,250	4,520	2.88	39.10	The year	3,050	3,200	2.04	27.81
1903.					1905.				
January	1,960	1,960	1.25	1.44	January	1,510	300	0.191	0.22
February	1,950	1,330	.847	.88	February	1,290	705	.449	.47
March	3,260	6,410	4.08	4.70	March	2,570	2,860	1.82	2.10
April	8,350	8,670	5.52	6.16	April	1,670	5,210	3.32	3.70
May	3,540	3,230	2.06	2.38	May	4,330	6,960	4.43	5.11
June	4,290	3,220	2.05	2.29	June	5,410	4,470	2.85	3.18
July	4,590	2,900	1.85	2.13	July	4,060	2,460	1.57	1.81
August	2,790	1,850	1.18	1.36	August	2,070	250	.159	.18
September	1,900	78	.050	.06	September	1,250	283	.180	.20
October	1,110	.....	.000	.00	October	864	−15	−.0096	−.01
November	684	140	.089	.10	November	838	235	.150	.17
December	675	675	.430	.50	December	1,000	740	.470	.54
The year	2,920	2,540	1.62	22.00	The year	2,240	2,040	1.30	17.69

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Monthly discharge of the Kennebec River at The Forks, Maine, for 1902 to 1913—Contd.

Month.	Mean discharge in second-feet.			Run-off (depth in inches on drainage area).	Month.	Mean discharge in second-feet.			Run-off (depth in inches on drainage area).
	As observed.	As corrected for storage.	Per square mile.			As observed.	As corrected for storage.	Per square mile.	
1906.					1910.				
January	1,570	1,570	1.00	1.15	January	2,000	1,330	0.847	0.98
February	1,100	1,290	.822	.86	February	1,750	1,550	.987	1.03
March	1,130	1,130	.720	.83	March	1,510	1,810	1.15	1.33
April	8,400	5,180	3.30	3.68	April	4,070	8,380	5.34	5.96
May	7,440	12,900	8.23	9.49	May	5,980	6,220	3.96	4.56
June	5,720	5,090	3.24	3.62	June	4,760	4,690	2.99	3.34
July	4,300	1,900	1.21	1.40	July	3,210	1,330	.847	.98
August	2,740	610	.389	.45	August	2,440	880	.560	.65
September	1,610	280	.178	.20	September	1,400	300	.191	.21
October	1,270	2,090	1.33	1.53	October	1,590	110	.070	.08
November	633	1,240	.790	.88	November	1,200	470	.299	.33
December	1,260	1,320	.841	.97	December	1,250	500	.318	.37
The year	3,100	2,880	1.84	25.06	The year	2,610	2,300	1.46	19.82
1907.					1911.				
January	920	690	0.439	0.51	January	1,280	535	.341	.39
February	1,260	470	.299	.31	February	900	410	.261	.27
March	1,620	565	.360	.42	March	760	580	.369	.43
April	1,570	4,730	3.01	3.36	April	905	2,530	1.61	1.80
May	8,440	12,300	7.81	9.00	May	2,600	5,460	3.48	4.01
June	5,070	4,950	3.15	3.51	June	3,030	2,290	1.46	1.63
July	3,920	3,690	2.35	2.71	July	2,330	960	.611	.70
August	3,670	2,590	1.65	1.90	August	2,290	942	.600	.69
September	1,940	1,210	.771	.86	September	1,720	925	.589	.66
October	1,190	2,390	1.52	1.75	October	980	1,150	.732	.84
November	5,950	6,580	4.19	4.68	November	487	975	.621	.69
December	2,720	2,950	1.88	2.17	December	923	2,810	1.79	2.06
The year	3,190	3,590	2.29	31.18	The year	1,520	1,630	1.04	14.17
1908.					1912.				
January	2,450	1,960	1.25	1.44	January	750	1,110	.707	.82
February	2,030	1,130	.720	.78	February	1,400	645	.411	.44
March	3,090	1,180	.752	.87	March	1,200	1,070	.681	.79
April	3,030	4,880	3.11	3.47	April	2,460	6,910	4.40	4.91
May	10,500	12,200	7.76	8.95	May	8,520	9,250	5.89	6.79
June	6,860	5,750	3.66	4.08	June	4,990	4,620	2.94	3.28
July	2,960	580	.369	.43	July	2,760	850	.541	.62
August	2,830	1,160	.739	.85	August	2,130	1,770	1.13	1.30
September	1,550	−140	− .089	− .10	September	1,610	1,240	.790	.88
October	906	−78	− .050	− .06	October	1,430	1,960	1.06	1.22
November	581	155	.099	.11	November	1,520	3,530	2.25	2.51
December	451	155	.099	.11	December	1,830	1,540	.981	1.13
The year	3,100	2,410	1.54	20.93	The year	2,560	2,850	1.81	24.69
1909.					1913.				
January	476	535	0.341	0.39	January	2,210	1,850	1.18	1.36
February	900	770	.490	.51	February	2,440	1,240	.790	.82
March	900	1,480	.943	1.09	March	2,560	3,220	2.05	2.36
April	2,710	7,830	4.99	5.57	April	7,250	8,930	5.69	6.35
May	8,020	11,000	7.02	8.09	May	4,170	4,180	2.66	3.07
June	3,950	2,780	1.77	1.98	June	3,480	2,870	1.83	2.04
July	3,230	1,680	1.07	1.23	July	3,320	1,740	1.11	1.28
August	2,560	440	.280	.32	August	2,590	455	.290	.33
September	1,800	1,620	1.03	1.15	September	1,590	300	.191	.21
October	1,260	2,200	1.40	1.61	October	1,090	2,260	1.44	1.66
November	1,380	1,510	.962	1.07	November	853	2,260	1.44	1.61
December	881	940	.599	.69	December	1,310	1,790	1.14	1.31
The year	2,350	2,730	1.74	23.70	The year	2,740	2,590	1.65	22.40

NOTE.—Mean discharge as corrected for storage determined by adding to or subtracting from the observed discharge the amount of water stored in or released from Moosehead Lake during each month. Negative values in October, 1905, and September and October, 1908, probably due to inaccuracy in the determination of observed discharge and of amount of water released from Moosehead Lake.

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KENNEBEC RIVER AT WATERVILLE, MAINE.

Location.—At the dam and mill of the Hollingsworth & Whitney Co. at Waterville, 2 miles above the mouth of Sebasticook River and about 3½ miles above the mouth of Messalonskee Stream.

Records available.—March 22, 1892, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—4,270 square miles.

Gage.—Rod gages in the pond above the dam and in the tailrace of the mill.

Determination of discharge.—Discharge computed from the flow over the dam, through the logway, and through 18 wheels of the mill. When flow is less than about 3,500 second-feet all the water is used through the wheels.

Winter flow.—As a rule, not affected by ice. During most years the winter flow passes through the wheels of the mill.

Regulation.—Numerous power plants and much storage above the station.

Accuracy.—Results only fair, as many wheels are in operation and only one reading a day is made for each wheel; record valuable because of its length and continuity.

Cooperation.—Records are obtained and estimates of daily discharge are furnished by the Hollingsworth & Whitney Co.

Daily discharge, in second-feet, of Kennebec River at Waterville, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,800	4,390	3,220	31,500	23,600	14,400	3,920	4,170	3,760	2,070	10,400	4,340
2	5,000	3,610	985	33,100	23,900	14,000	4,080	4,240	2,820	2,340	8,570	4,420
3	4,750	4,540	3,790	27,600	16,100	12,400	3,900	2,030	2,680	3,020	8,670	4,400
4	6,530	4,470	2,990	23,600	15,300	14,400	3,420	4,090	2,850	9,700	7,090	4,060
5	4,750	4,560	3,060	19,600	16,200	11,100	4,380	4,190	2,990	7,190	7,510	4,380
6	6,410	4,480	3,080	22,300	14,900	11,200	3,080	3,670	2,390	4,980	7,200	4,340
7	5,870	4,310	3,140	24,200	14,000	10,200	4,250	3,460	554	4,610	7,010	2,000
8	5,240	6,560	3,180	21,500	14,300	7,840	3,840	3,800	2,470	3,970	4,260	4,550
9	6,700	1,500	1,910	20,200	9,460	6,950	3,920	3,450	2,940	3,180	2,680	9,260
10	4,880	3,730	3,600	18,700	12,600	7,930	4,130	855	2,770	2,880	6,200	8,570
11	4,180	3,400	3,980	10,400	9,790	7,210	4,430	4,050	2,390	2,290	23,900	6,030
12	1,980	3,250	3,180	9,700	3,560	6,220	6,510	4,130	2,590	615	16,400	7,660
13	4,690	3,370	3,640	15,100	8,580	5,820	6,140	3,060	2,330	3,360	11,900	4,820
14	4,630	3,400	3,620	16,100	8,020	5,200	5,660	2,920	958	4,520	10,500	1,860
15	3,820	3,430	4,310	19,200	7,280	2,570	5,760	3,020	3,630	3,960	7,590	4,610
16	3,890	1,090	5,540	23,200	6,950	5,660	5,400	3,810	2,850	3,980	6,550	4,140
17	4,160	3,820	8,980	24,800	6,930	4,720	5,590	1,790	2,630	4,360	7,010	3,700
18	4,490	3,460	6,910	28,200	5,210	4,740	4,730	4,670	2,330	4,340	6,270	3,510
19	2,530	3,480	6,720	24,800	3,780	4,710	5,240	4,420	2,340	3,010	5,520	3,360
20	5,710	3,540	9,000	25,200	6,300	5,090	5,040	4,100	2,180	4,880	6,190	3,360
21	7,260	3,520	11,800	23,100	6,100	4,430	5,820	3,140	733	16,400	7,110	604
22	6,820	3,560	22,600	23,700	6,830	4,030	4,990	3,480	2,800	26,400	8,750	3,900
23	6,910	933	26,400	21,000	6,860	4,940	4,450	4,020	3,130	17,200	7,490	3,430
24	6,290	3,540	20,700	23,600	10,200	3,790	4,110	1,200	12,100	12,800	7,140	3,550
25	5,200	3,350	43,400	25,900	12,600	3,840	4,650	3,190	5,460	10,300	6,270	565
26	3,980	3,270	39,300	30,100	11,000	4,090	3,930	2,640	4,720	10,000	5,890	4,330
27	4,490	3,220	34,500	31,900	8,500	4,060	4,430	2,280	3,540	21,300	4,710	3,400
28	4,210	3,240	34,400	30,600	8,520	3,640	4,180	3,160	951	25,100	5,390	1,960
29	4,310	.....	36,300	29,800	9,190	2,950	4,150	3,430	2,070	15,500	3,960	3,090
30	4,000	.....	25,900	29,700	17,500	4,260	4,450	3,040	2,180	14,700	2,100	2,980
31	3,880	.....	25,300	.....	15,200	.....	4,500	2,260	.....	11,400	.....	2,670

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Monthly discharge of Kennebec River at Waterville, Maine, for 1913.

[Drainage area, 4,270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	7,260	1,980	4,910	1.15	1.33
February	6,560	983	3,540	.829	.86
March	43,400	985	13,100	3.07	3.54
April	33,100	9,700	23,600	5.53	6.17
May	23,900	3,560	10,900	2.55	2.94
June	14,400	2,570	6,750	1.58	1.76
July	6,510	3,080	4,620	1.08	1.24
August	4,670	855	3,280	.768	.89
September	12,100	554	2,940	.688	.77
October	26,400	615	8,400	1.97	2.27
November	23,900	2,100	7,670	1.80	2.01
December	9,260	565	4,000	.936	1.08
The year	43,400	554	7,820	1.83	24.99

DEAD RIVER AT THE FORKS, MAINE.

Location.—One-eighth mile above farmhouse of Jeremiah Durgin, 1½ miles west of The Forks.

Records available.—September 29, 1901, to August 15, 1907; March 16, 1910, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—878 square miles.

Gage.—Inclined staff bolted to large bowlder on the left bank, a short distance from observer's house.

Channel and control.—Practically permanent; banks medium high; overflowed only at extreme high water.

Discharge measurements.—Made from a cable a short distance above the gage.

Winter flow.—Affected by ice.

Regulation.—A number of dams on the lakes above; used solely for log driving.

Accuracy.—Results fair.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Dead River at The Forks, Maine, during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 8	C. C. Babb	2.43	1,820	July 8	G. C. Danforth	1.05	373
29	G. C. Danforth	4.78	8,280				

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Daily gage height, in feet, of Dead River at The Forks, Maine, for 1913.

[Mrs. Eva M. Forsythe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.48	.....	.....	3.95	3.50	3.80	1.10	1.00	.90	2.25	2.25	1.68
2	1.42	1.60	1.80	3.85	3.00	3.50	1.10	.98	.90	.72	2.08	1.55
3	1.40	.....	.....	3.78	3.40	3.05	1.10	.95	.90	1.15	1.90	1.50
4	1.35	.....	.....	3.45	2.60	2.60	1.10	.92	.85	2.05	1.82	1.50
5	1.32	.....	.....	3.12	5.60	2.28	1.10	.90	.85	1.88	1.80	1.50
6	1.30	.....	.....	2.80	2.25	2.15	1.10	.90	.85	1.60	1.72	1.50
7	1.30	.....	.....	2.58	3.15	1.95	1.10	.90	.80	1.22	1.68	1.50
8	1.30	.....	.....	2.45	4.25	1.82	1.10	.90	.80	.98	1.62	1.42
9	1.30	1.30	1.75	2.32	3.10	1.70	1.10	.90	.80	.90	1.60	1.28
10	1.20	.....	.....	2.32	1.90	1.62	1.25	.88	.90	.78	3.15	1.18
11	1.10	.....	.....	2.12	1.80	1.58	1.40	.82	.80	.85	3.80	1.12
12	1.00	.....	.....	1.95	1.85	1.50	1.35	.80	.75	1.15	3.35	1.10
13	1.00	.....	.....	2.20	1.70	1.42	1.28	.88	.75	1.38	2.60	1.18
14	1.15	.....	.....	2.65	1.70	1.38	1.22	.90	.70	1.48	2.32	1.40
15	1.15	.....	.....	2.90	1.65	1.30	1.20	.90	.70	1.60	2.22	1.40
16	1.35	2.20	3.00	3.25	1.62	1.30	1.18	.90	.70	1.68	2.12	1.30
17	1.15	.....	.....	3.55	1.60	1.28	1.10	.90	.70	1.95	2.00	1.30
18	1.20	.....	.....	3.55	1.60	1.25	1.10	.90	.70	1.85	1.78	1.30
19	.....	.....	.....	3.45	1.60	1.20	1.10	.90	.70	1.80	1.70	1.30
20	.....	.....	.....	3.40	1.60	1.20	1.10	.90	.70	1.88	1.85	1.30
21	.....	.....	.....	3.40	1.60	1.20	1.15	.90	.70	3.32	2.35	1.30
22	.....	.....	3.85	3.25	1.60	1.20	1.20	.90	.75	3.45	2.32	1.25
23	.....	2.45	3.78	3.90	1.70	1.20	1.18	.90	1.15	2.68	2.40	1.22
24	.....	.....	3.85	4.10	1.80	1.20	1.10	.90	1.70	2.22	2.05	1.20
25	.....	.....	3.62	4.25	1.80	1.20	1.10	.90	1.70	1.98	1.82	1.20
26	2.50	.....	4.10	4.30	2.25	1.20	1.05	.90	1.55	2.18	1.70	1.20
27	.....	.....	4.68	4.25	3.15	1.15	1.00	.90	1.35	3.25	1.65	1.15
28	.....	.....	4.90	4.80	4.00	1.12	1.00	.90	1.12	3.40	1.52	1.15
29	.....	.....	4.80	4.90	3.92	1.10	1.00	.90	.98	3.10	1.50	1.18
30	.....	.....	4.80	3.95	3.85	1.10	1.00	.90	.88	2.70	1.58	1.35
31	.....	.....	4.75	.....	3.80	.....	1.00	.90	.....	2.45	.....	1.55

NOTE.—Discharge relation Jan. 19 to Mar. 21 seriously affected by ice.

Daily discharge, in second-feet, of Dead River at The Forks, Maine, for 1913.

Day.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	940	.....	5,980	4,710	5,530	510	415	325	240	2,120	1,240
2	865	.....	5,680	3,550	4,710	510	415	325	160	1,830	1,030
3	840	.....	5,530	4,460	3,660	510	370	325	560	1,540	965
4	780	.....	4,580	2,750	2,750	510	325	282	1,780	1,420	965
5	744	.....	3,770	12,100	2,200	510	325	282	1,540	1,390	965
6	720	.....	3,140	2,120	1,940	510	325	282	1,100	1,270	965
7	720	.....	2,750	3,880	1,620	510	325	240	610	1,210	965
8	720	.....	2,470	6,960	1,390	510	325	240	415	1,130	840
9	720	.....	2,200	3,770	1,240	510	325	240	325	1,100	720
10	610	.....	2,200	1,540	1,100	665	325	325	240	3,880	610
11	510	.....	1,860	1,390	1,100	840	240	240	282	5,530	510
12	415	.....	1,620	1,460	965	780	240	200	560	4,340	510
13	415	.....	2,030	1,240	840	720	325	200	840	2,750	610
14	560	.....	2,840	1,240	840	610	325	160	965	2,240	840
15	560	.....	3,340	1,170	720	610	325	160	1,100	2,060	840
16	780	.....	4,100	1,100	720	610	325	160	1,240	1,890	720
17	560	.....	4,840	1,100	720	510	325	160	1,620	1,700	720
18	610	.....	4,840	1,100	665	510	325	160	1,460	1,360	720
19	.....	.....	4,580	1,100	610	510	325	160	1,390	1,240	720
20	.....	.....	4,460	1,100	610	510	325	160	1,540	1,460	720
21	.....	.....	4,460	1,100	610	560	325	160	4,220	2,290	720
22	.....	5,680	4,100	1,100	610	610	325	200	4,580	2,240	665
23	.....	5,470	5,830	1,240	610	610	325	560	2,940	2,380	610
24	.....	5,680	6,460	1,390	610	510	325	1,240	2,030	1,780	610
25	.....	5,020	6,960	1,390	610	510	325	1,240	1,700	1,420	610
26	.....	6,460	7,130	2,120	610	462	325	1,030	2,030	1,240	610
27	.....	8,500	6,960	3,880	560	415	325	780	4,100	1,170	560
28	.....	9,320	8,940	6,140	510	415	325	510	4,460	992	560
29	.....	8,940	9,320	5,830	510	415	325	415	3,770	965	610
30	.....	8,940	5,980	5,680	510	415	325	325	2,940	1,070	780
31	.....	8,760	.....	5,530	.....	415	325	.....	2,470	.....	1,030

NOTE.—Discharge determined from a rating curve fairly well defined below 13,000 second-feet. Mean discharge during the frozen season estimated from climatologic data and by comparison with records on adjacent streams as follows: Jan. 19 to 31, 600 second-feet, Feb. 1 to Mar. 21, 500 second-feet.

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Monthly discharge of Dead River at The Forks, Maine, for 1913.

[Drainage area, 878 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	.....	.....	641	0.73	0.84
February	.....	.....	500	.57	.59
March	.....	.....	2,690	3.06	3.53
April	9,320	1,620	4,630	5.27	5.88
May	12,100	1,100	3,010	3.43	3.96
June	5,530	510	1,320	1.50	1.67
July	840	415	542	.62	.72
August	415	240	327	.37	.43
September	1,240	160	370	.42	.47
October	4,580	160	1,720	1.96	2.26
November	5,530	965	1,900	2.16	2.41
December	1,240	510	759	.86	.99
The year	12,100	160	1,530	1.74	23.74

SANDY RIVER NEAR FARMINGTON, MAINE.

Location.—At Fairbanks highway bridge, 3 miles above Farmington.

Records available.—July 11, 1910, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—270 square miles.

Gage.—Chain.

Channel and control.—Practically permanent; left bank high; right bank subject to overflow in extreme freshets; current swift at high and medium stages but sluggish during low water.

Discharge measurements.—Made from the bridge.

Winter flow.—Affected by ice.

Regulation.—No storage basins above the station; the water-power dam at Phillips may slightly affect the flow at the station.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

Discharge measurements of Sandy River near Farmington, Maine, during 1913.

[Made by G. C. Danforth.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 22	3.30	288
Aug. 27	2.20	35.5

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Daily gage height, in feet, of Sandy River near Farmington, Maine, for 1913.

[L. A. Daggett, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.5	4.0	7.75	4.7	.....	2.5	2.5	2.2	2.5	4.2	3.3
2	.....	.....	.....	5.5	4.4	4.2	2.5	2.4	2.2	2.7	4.0	3.3
3	.....	.....	.....	4.9	4.4	3.7	2.5	2.3	2.2	6.25	3.7	3.3
4	5.7	.....	.....	4.6	4.4	3.5	2.5	2.4	2.2	6.0	3.8	3.4
5	.....	.....	.....	4.8	4.1	3.4	2.4	2.4	2.2	4.7	3.7	3.4
6	.....	.....	.....	4.3	4.1	3.5	2.5	2.5	2.2	3.9	3.6	3.2
7	.....	.....	.....	4.6	4.0	3.4	2.5	2.4	2.1	3.8	3.6	3.2
8	.....	.....	3.9	4.2	3.8	3.3	2.5	2.3	2.1	3.1	3.5	4.5
9	.....	.....	.....	4.0	3.6	3.2	2.4	2.3	2.1	3.0	3.5	4.5
10	.....	3.8	.....	3.9	3.6	3.2	2.5	2.4	2.1	2.9	9.3	3.9
11	4.5	.....	.....	4.5	3.5	3.1	4.4	2.4	2.1	2.9	6.0	3.7
12	.....	.....	.....	4.5	3.4	3.0	3.3	2.3	2.1	2.9	5.7	3.9
13	.....	.....	.....	5.2	3.4	3.0	3.0	2.3	2.1	3.4	4.4	4.4
14	.....	.....	4.4	5.4	3.3	2.9	2.7	2.4	2.2	3.5	4.2	4.0
15	.....	4.0	.....	6.0	3.2	2.9	2.5	2.3	2.3	3.3	4.0	3.8
16	.....	.....	.....	6.2	3.2	2.9	2.5	2.3	2.2	3.8	3.8	3.7
17	.....	.....	.....	6.0	3.3	3.0	2.5	2.2	2.1	3.6	3.7	3.5
18	4.5	.....	.....	5.7	3.2	3.0	2.6	2.2	2.2	3.4	3.7	3.4
19	.....	.....	.....	5.8	3.4	2.9	2.8	2.2	2.2	3.4	3.6	3.2
20	.....	.....	.....	6.0	3.3	2.8	2.7	2.1	2.1	4.4	5.1	3.2
21	.....	.....	.....	5.0	3.4	2.9	2.6	2.05	2.1	9.05	5.5	3.1
22	.....	4.1	9.1	4.9	3.3	2.9	2.6	2.1	4.6	5.2	5.5	3.9
23	.....	.....	.....	5.5	4.5	2.8	2.5	2.3	6.25	4.4	4.9	3.6
24	.....	.....	.....	6.1	4.9	2.7	2.5	2.2	4.0	4.0	4.6	3.9
25	4.8	.....	.....	6.6	5.4	2.6	2.5	2.3	3.3	4.2	3.6	4.0
26	.....	.....	.....	6.7	5.0	2.6	2.5	2.1	3.0	5.8	3.5	3.9
27	.....	.....	.....	6.6	4.4	2.6	2.5	2.2	2.8	8.3	3.4	4.1
28	.....	.....	.....	5.7	3.9	2.6	2.4	2.2	2.7	5.5	3.2	4.0
29	.....	.....	.....	5.5	6.5	2.6	2.5	2.3	2.6	4.9	3.3	4.0
30	.....	.....	.....	5.2	5.4	2.5	2.5	2.3	2.5	4.6	3.4	3.9
31	.....	.....	.....	.....	5.0	.....	2.5	2.3	.....	4.6	.....	4.0

NOTE.—Discharge relation Jan. 1 to Mar. 21 seriously affected by ice.

Daily discharge, in second-feet, of Sandy River near Farmington, Maine, for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4,250	993	940	83	83	38	83	667	283
2	.....	1,640	787	667	83	67	38	121	562	283
3	.....	1,140	787	431	83	52	38	2,420	431	283
4	.....	923	787	353	83	67	38	2,140	473	317
5	.....	1,060	613	317	67	67	38	993	431	317
6	.....	725	613	353	83	83	38	517	391	251
7	.....	923	562	317	83	67	25	473	391	251
8	.....	667	473	283	83	52	25	221	353	853
9	.....	562	391	251	67	52	25	193	353	853
10	.....	517	391	251	83	67	25	167	6,500	517
11	.....	853	353	221	787	67	25	167	2,140	431
12	.....	853	317	193	283	52	25	167	1,830	517
13	.....	1,380	317	193	193	52	25	317	787	787
14	.....	1,540	283	167	121	67	38	353	667	562
15	.....	2,140	251	167	83	52	52	283	562	473
16	.....	2,360	251	167	83	52	38	473	473	431
17	.....	2,140	283	193	83	38	25	391	431	353
18	.....	1,830	251	193	101	38	38	317	431	317
19	.....	1,930	317	167	143	38	38	317	391	251
20	.....	2,140	283	143	121	25	25	787	1,300	251
21	.....	1,220	317	167	101	19	25	6,120	1,640	221
22	6,200	1,140	283	167	101	25	923	1,380	1,640	517
23	6,000	1,640	853	143	83	52	2,420	787	1,140	391
24	5,800	2,250	1,140	121	83	38	562	562	923	517
25	5,600	2,800	1,540	101	83	52	283	667	391	562
26	5,400	2,920	1,220	101	83	25	193	1,930	353	517
27	5,200	2,800	787	101	83	38	143	5,020	317	613
28	5,000	1,830	517	101	67	38	121	1,640	251	562
29	4,000	1,640	2,690	101	83	52	101	1,140	283	562
30	4,600	1,380	1,540	83	83	52	83	923	317	517
31	4,400	.....	1,220	.....	83	52	.....	923	.....	562

NOTE.—Discharge determined from a rating curve well defined between 50 and 2,000 second-feet but poorly defined above 2,000 second-feet. Discharge during frozen season estimated from climatologic data and by comparison with records on adjacent streams as follows: Jan. 1 to 31, mean discharge 350 second-feet; Feb. 1 to 28, 150 second-feet; Mar. 1 to 21, 200 second-feet.

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Monthly discharge of Sandy River near Farmington, Maine, for 1913.

[Drainage area, 270 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	.....	.....	350	1.30	1.50
February	.....	.....	150	.555	.58
March	.....	.....	1,820	6.74	7.77
April	4,250	517	1,640	6.07	6.77
May	2,690	251	691	2.56	2.95
June	940	83	238	.881	.98
July	787	67	120	.444	.51
August	83	19	51	.189	.22
September	2,420	25	184	.681	.76
October	6,120	83	1,030	3.81	4.39
November	6,500	251	894	3.31	3.69
December	853	221	456	1.69	1.95
The year	6,500	19	635	2.35	32.07

SEBASTICOOK RIVER AT PITTSFIELD, MAINE.

Location.—At steel highway bridge just above the Maine Central Railroad bridge in the town of Pittsfield.

Records available.—July 27, 1908, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—320 square miles.

Gage.—Chain.

Channel and control.—Practically permanent; banks high and rocky and not subject to overflow; stream confined between the abutments of the bridge.

Discharge measurements.—Made from the highway bridge.

Winter flow.—Not generally affected by ice, as the rapid fall and proximity of the power plant immediately above the station tend to keep the river open.

Regulation.—About 800 feet upstream from the station is the dam of the Waverly woolen mill. About 5 miles below the station and 2 miles from Burnham is the dam of the Sebasticook Power Co., but the fall of the stream prevents backwater from the lower dam.

Accuracy.—The accuracy of the mean daily gage height given in the table below is more or less affected by fluctuations in stage caused by the operation of the dams above the station for night storage. Conditions favor the accurate determination of discharge, and a fair rating curve has been developed; a few more measurements are needed to closely determine the flow at extreme high and extreme low stages.

Cooperation.—Results furnished by the Maine State Water Storage Commission.

The following discharge measurement was made by G. C. Danforth:
April 18, 1913: Gage height, 5.20 feet; discharge, 2,010 second-feet.

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Daily gage height, in feet, of Sebasticook River at Pittsfield, Maine, for 1913.

[C. D. Morrill, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.7	3.2	6.1	4.0	3.7	2.75	2.8	2.85	2.6	3.7	3.5
2	3.35	3.5	3.1	5.95	3.65	3.7	2.7	2.7	2.7	3.05	3.7	3.4
3	3.4	3.6	3.4	5.7	3.15	3.7	2.65	2.5	2.65	3.15	3.75	3.3
4	3.6	3.55	3.4	5.9	2.95	3.6	2.5	2.7	2.75	3.15	3.75	3.2
5	3.5	3.55	3.45	5.6	2.7	3.55	2.5	2.85	2.55	2.95	3.7	3.2
6	3.7	3.65	3.5	5.45	2.7	3.55	2.4	2.7	2.85	2.85	3.55	3.2
7	3.7	3.6	3.4	5.35	2.9	3.5	2.75	2.85	2.7	2.85	3.55	3.1
8	3.6	3.0	3.2	5.2	3.0	3.2	2.75	2.9	2.9	2.9	3.45	3.6
9	3.7	2.4	3.0	4.95	3.25	3.25	2.75	2.75	2.85	3.0	3.45	3.7
10	3.6	2.8	3.35	4.9	3.2	3.3	2.85	2.5	2.5	3.0	3.45	3.9
11	3.3	3.0	3.35	4.95	3.1	3.25	2.95	2.75	2.45	2.95	3.5	3.9
12	3.6	3.2	3.2	4.9	3.2	3.2	2.9	2.85	2.55	2.9	3.75	3.9
13	3.55	3.25	3.3	5.0	3.2	3.15	2.5	2.75	2.6	2.95	3.9	3.9
14	3.55	3.25	3.4	5.3	3.15	2.9	2.8	2.7	2.4	2.65	3.85	3.8
15	3.5	3.1	3.35	5.2	3.15	2.7	2.9	2.7	2.7	2.9	3.8	3.8
16	3.55	3.0	3.4	5.1	3.15	3.25	2.75	2.65	2.7	2.95	3.65	3.6
17	3.7	3.4	3.6	5.2	3.0	3.3	2.75	2.4	2.7	2.95	3.7	3.7
18	3.6	3.45	3.7	5.1	2.9	3.5	2.9	2.75	2.45	3.0	3.65	3.6
19	3.5	3.45	3.75	5.1	3.1	3.0	2.95	2.7	2.75	2.5	3.7	3.2
20	3.9	3.3	3.9	5.0	3.05	3.05	2.75	2.7	2.9	2.8	3.7	3.2
21	4.0	3.4	4.2	5.1	3.1	2.95	3.05	2.75	2.5	3.1	3.7	3.2
22	4.0	3.4	4.95	5.0	3.05	2.5	3.0	2.6	2.9	3.1	3.65	3.0
23	4.1	3.25	5.2	5.0	3.2	3.15	2.95	2.6	3.05	3.2	3.6	3.4
24	4.05	3.1	5.25	4.85	2.95	3.2	2.9	2.5	2.95	3.15	3.6	3.4
25	3.9	3.1	5.45	4.7	2.95	3.2	2.9	2.75	2.9	3.1	3.65	3.0
26	3.8	3.1	6.0	4.6	3.25	3.1	2.8	2.75	2.7	3.1	3.55	3.3
27	4.1	3.25	6.1	4.5	3.15	2.85	2.5	2.55	3.0	3.25	3.5	3.0
28	3.9	3.4	5.95	4.45	3.05	2.75	2.8	2.7	2.75	3.35	3.4	3.0
29	3.8	.....	5.9	4.35	3.35	2.75	2.7	2.55	3.05	3.55	3.4	3.2
30	3.8	.....	5.8	4.05	3.75	2.7	2.7	2.4	2.9	3.7	3.45	3.1
31	3.8	.....	5.7	.....	3.95	.....	2.9	2.4	.....	3.8	.....	3.2

Daily discharge, in second-feet, of Sebasticook River at Pittsfield, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	395	540	310	3,260	745	540	142	158	176	97	540	438
2	374	438	270	3,060	512	540	125	125	125	250	540	395
3	395	485	395	2,720	290	540	111	71	111	290	570	352
4	485	462	395	2,990	212	495	71	125	142	290	570	310
5	438	462	416	2,590	125	462	71	176	84	212	540	310
6	540	512	438	2,400	125	462	50	125	176	176	462	310
7	540	485	395	2,260	193	438	142	176	125	176	462	270
8	485	230	310	2,080	230	310	142	193	193	193	416	485
9	540	50	230	1,770	331	331	142	142	176	230	416	540
10	485	158	374	1,710	310	352	176	71	71	230	416	668
11	352	230	374	1,770	270	331	212	142	60	212	438	668
12	485	310	310	1,710	310	310	193	176	84	193	570	668
13	462	331	352	1,830	310	290	71	142	97	212	668	668
14	462	331	395	2,200	290	193	158	125	50	111	634	600
15	438	270	374	2,080	290	125	193	125	125	193	600	600
16	462	230	395	1,960	290	331	142	111	125	212	512	485
17	540	395	485	2,080	230	352	142	50	125	212	540	540
18	485	416	540	1,960	193	438	193	142	60	230	512	485
19	438	416	570	1,960	270	230	212	125	142	71	540	310
20	668	352	668	1,830	250	250	142	125	193	158	540	310
21	745	395	938	1,960	270	212	250	142	71	270	540	310
22	745	395	1,770	1,830	250	71	230	97	193	270	512	230
23	838	331	2,060	1,830	310	290	212	97	250	310	485	395
24	792	270	2,140	1,650	212	310	193	71	212	290	485	395
25	668	270	2,400	1,470	212	310	193	142	193	270	512	230
26	600	270	3,130	1,360	331	270	158	142	125	270	462	352
27	838	331	3,260	1,250	290	176	71	84	230	331	438	230
28	668	395	3,060	1,200	250	142	158	125	142	374	395	230
29	600	.....	2,990	1,090	374	142	125	84	250	462	395	310
30	600	.....	2,860	792	570	125	125	50	193	540	416	270
31	600	.....	2,720	.....	706	.....	193	50	.....	600	.....	310

NOTE.—Discharge determined from a rating curve fairly well fined above 70 second-feet.

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Monthly discharge of Sebasticook River at Pittsfield, Maine, for 1913.

[Drainage area, 320 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	838	352	554	1.73	1.99
February	540	50	348	1.09	1.14
March	3,260	230	1,140	3.56	4.10
April	3,260	792	1,960	6.12	6.83
May	745	125	308	.962	1.11
June	540	71	312	.975	1.09
July	250	50	153	.478	.55
August	193	50	120	.375	.43
September	250	50	143	.447	.50
October	600	71	256	.800	.92
November	668	395	504	1.58	1.76
December	668	230	409	1.28	1.48
The year	3,260	50	517	1.62	21.90

COBBOSSEECONTEE STREAM AT GARDINER, MAINE.

Location.—At the dam of the Gardiner Water Power Co., in the city of Gardiner.

Records available.—June 16, 1890, to December 31, 1913.

Drainage area.—220 square miles.

Gages.—One in pond above dam and one in tailrace of power house.

Determination of flow.—The discharge is determined by considering (1) the flow over the dam, usually nothing except for a short time in the spring; (2) the flow through two gates; and (3) the flow through a 39-inch Hercules wheel. The computations of daily discharge are made by the engineers of the S. D. Warren Co. from tables of discharge based on careful experiments.

Winter flow.—Not affected by ice.

Regulation.—The extensive lakes in the basin are controlled by storage dams and the stream affords a remarkable example of the regularity of flow that can be obtained with proper storage. Except for a short time in the spring no water is wasted.

Accuracy.—Results are considered good for a station of this type.

Cooperation.—Station maintained by the S. D. Warren Co., which furnished the records of daily discharge for publication.

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Daily discharge, in second-feet, of Cobbosseecontee Stream at Gardiner, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	260	280	280	812	250	a 220	250	250	200	180	250	270
2	260	a 0	a 0	870	250	842	250	250	200	180	a 0	270
3	260	280	280	895	250	830	250	a 250	200	180	250	270
4	260	280	280	900	a 120	610	125	250	200	180	250	270
5	a 0	280	280	1,070	250	360	170	250	200	a 0	250	270
6	260	280	280	a 1,600	250	300	a 0	250	200	180	250	270
7	260	280	280	1,660	250	300	250	250	a 0	190	250	a 0
8	260	280	280	1,620	250	a 0	250	250	200	200	250	270
9	260	a 0	a 0	1,550	250	265	250	250	190	200	a 0	270
10	260	280	280	1,460	250	250	250	a 0	180	200	250	270
11	260	280	280	1,200	a 0	250	250	250	180	200	250	270
12	a 0	280	280	850	250	250	250	250	180	a 0	250	270
13	260	280	280	a 910	250	250	a 0	250	180	200	250	270
14	260	280	280	1,040	250	250	250	250	a 0	200	250	a 0
15	260	280	280	1,030	250	a 0	250	250	180	200	250	270
16	260	a 0	a 0	950	250	250	250	250	180	225	a 0	270
17	260	280	280	740	250	250	250	a 0	180	250	250	270
18	260	280	280	510	a 0	250	250	250	180	250	250	270
19	a 0	280	280	300	250	250	250	250	180	a 0	250	270
20	260	280	280	a 150	250	250	a 0	250	180	250	250	270
21	260	280	340	280	250	250	250	250	a 0	250	250	a 90
22	270	280	610	280	250	a 0	250	250	180	250	250	270
23	280	a 0	a 800	280	250	250	250	250	180	250	a 0	270
24	280	280	820	265	250	250	250	a 0	180	250	270	270
25	280	280	780	250	a 0	250	250	250	180	250	270	130
26	a 0	280	780	250	250	250	250	250	180	a 0	270	270
27	280	280	770	a 0	250	250	a 0	250	180	250	130	270
28	280	280	770	250	250	250	250	250	a 0	250	270	a 0
29	280	.....	790	250	250	a 0	250	250	180	250	270	270
30	280	.....	a 750	250	190	250	250	250	180	250	a 0	270
31	280	.....	780	.....	250	.....	250	a 0	.....	250	.....	270

a Sunday.

Monthly discharge of Cobbosseecontee Stream at Gardiner, Maine, for 1913.

[Drainage area, 220 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	280	0	232	1.05	1.21
February	280	0	240	1.09	1.14
March	820	0	413	1.88	2.17
April	1,660	0	747	3.40	3.79
May	250	0	220	1.00	1.15
June	842	0	274	1.24	1.38
July	250	0	211	.959	1.11
August	250	0	218	.991	1.14
September	200	0	161	.732	.82
October	250	0	192	.873	1.01
November	270	0	208	.945	1.05
December	270	0	234	1.06	1.22
The year	1,660	0	279	1.26	17.19

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ANDROSCOGGIN RIVER BASIN.

ANDROSCOGGIN RIVER AT ERROL DAM, N. H.

Location.—At Errol dam, 1 mile above the town of Errol.

Records available.—January 1, 1905, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—1,095 square miles.

Gage.—Movable rod gage; readings taken each day from the sill of deep gate No. 6; elevation of zero of gage or sill of gate is 1,231.3 feet above mean sea level.

Discharge.—Computed from discharge through 14 gates in the dam by means of coefficients determined from a few discharge measurements.[1]

Winter flow.—Little affected by ice.

Regulation.—Errol dam controls the storage of Umbagog Lake, the lower of the Rangeley series of lakes, comprising the principal storage of the Androscoggin River and amounting to nearly 20 billion cubic feet, and also a recently developed storage site on Magalloway River created by the Azicohos dam, which amounts to about 8 billion cubic feet, thus making the total storage about 28 billion cubic feet. Errol dam is located about 5 miles below the outlet of Umbagog Lake and about 3.5 miles below the mouth of Magalloway River, thus making this stream one of the feeders of Umbagog Lake.

Accuracy.—Results roughly approximate.

Cooperation.—Records are obtained and computations of daily discharge made under the direction of Mr. Walter H. Sawyer, agent for Union Water Power Co., who furnished data to the Survey.

Daily discharge, in second-feet, of Androscoggin River at Errol dam, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,000	2,190	2,140	5,550	6,700	5,030	1,970	2,070	1,820	1,660	811	1,490
2	2,010	2,360	2,160	5,600	6,700	4,800	1,930	2,080	1,820	1,560	807	1,330
3	2,080	1,920	2,160	5,530	6,280	4,800	1,890	2,030	1,820	996	1,190	1,500
4	2,060	1,740	2,160	5,370	5,200	4,750	1,950	2,120	1,800	1,380	1,440	1,580
5	2,040	2,060	2,160	5,410	5,200	4,200	2,060	2,030	1,820	1,670	1,430	1,630
6	2,010	2,060	2,160	5,370	4,570	3,470	2,040	1,960	1,920	1,680	1,400	1,710
7	2,040	1,920	2,170	5,150	3,800	2,970	2,000	2,060	1,980	1,610	1,350	1,710
8	2,010	1,940	2,200	4,820	3,330	2,790	2,100	2,160	1,980	1,560	1,320	1,660
9	2,020	2,180	2,310	4,660	2,880	2,560	2,140	2,170	1,780	1,530	1,060	1,500
10	1,500	1,770	2,220	4,360	2,220	2,420	1,920	2,160	1,550	1,540	574	1,630
11	1,840	1,810	2,180	4,170	2,420	2,410	1,830	2,210	1,730	1,540	584	2,180
12	2,060	2,180	2,210	3,850	2,270	2,390	1,860	2,190	1,840	1,310	688	2,080
13	1,480	2,140	2,250	3,610	2,220	2,220	1,900	2,170	1,770	1,510	1,210	1,920
14	1,560	2,180	2,120	3,540	2,100	1,980	1,920	2,260	1,760	1,730	1,180	1,840
15	1,650	2,140	2,050	3,500	1,800	1,980	1,870	2,290	1,790	1,720	1,170	1,670
16	1,300	2,190	2,150	3,540	1,760	1,930	1,820	2,240	1,720	1,700	1,370	1,860
17	1,380	2,120	2,210	3,630	1,620	1,890	1,870	2,190	1,820	1,600	1,470	1,980
18	1,400	2,080	2,190	3,700	1,740	1,860	1,900	2,140	1,800	1,570	1,430	2,040
19	2,290	2,060	2,170	3,760	1,680	1,840	1,880	2,030	1,820	1,590	1,380	1,960
20	2,470	2,050	2,170	3,860	1,660	1,820	1,890	1,970	1,800	1,510	1,370	1,930
21	2,470	2,050	2,300	3,880	1,710	1,840	1,900	2,050	1,720	1,190	921	1,890
22	2,480	2,050	2,570	3,930	1,720	2,030	1,920	2,030	1,410	1,110	398	1,760
23	2,490	2,060	2,720	3,980	1,960	2,050	1,900	2,060	660	1,160	994	1,810
24	2,520	2,050	2,940	4,150	2,080	2,030	2,010	1,980	875	1,030	1,310	1,820
25	2,380	2,050	3,220	4,620	2,110	2,000	1,960	1,940	1,750	691	1,500	1,800
26	2,440	2,060	3,800	5,950	2,210	1,980	2,050	1,860	1,650	696	1,640	1,760
27	2,240	1,960	4,200	6,530	2,260	1,940	2,050	1,800	1,610	635	1,620	1,800
28	2,300	2,100	4,750	6,670	2,290	1,930	1,980	1,800	1,650	604	1,590	1,800
29	2,280	.....	5,300	6,700	2,990	1,940	1,980	1,800	1,690	608	1,530	1,800
30	2,270	.....	5,490	6,700	4,410	1,980	1,960	1,780	1,690	653	1,430	1,810
31	2,260	.....	5,550	.....	5,030	.....	2,010	1,760	.....	811	.....	1,800

[1] U. S. Geol. Survey Water-Supply Paper 321, p. 61, 1914.

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Monthly discharge of Androscoggin River at Errol dam, N. H., for 1913.

[Drainage area, 1,095 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	2,520	1,300	2,040	1.86	2.14
February	2,360	1,740	2,050	1.87	1.95
March	5,550	2,050	2,790	2.55	2.94
April	6,700	3,500	4,740	4.33	4.83
May	6,700	1,620	3,060	2.79	3.22
June	5,030	1,820	2,590	2.37	2.64
July	2,140	1,820	1,950	1.78	2.05
August	2,290	1,760	2,040	1.86	2.14
September	1,980	660	1,690	1.54	1.72
October	1,730	604	1,300	1.19	1.37
November	1,640	398	1,210	1.11	1.24
December	2,180	1,430	1,790	1.63	1.88
The year	6,700	398	2,270	2.07	28.12

ANDROSCOGGIN RIVER AT RUMFORD FALLS, MAINE.

Location.—At the dam of the Rumford Falls Power Co., at Rumford Falls.

Records available.—May 18, 1892, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—2,090 square miles.

Gage.—One located in pond above dam and one in tailrace of power house.

Discharge.—Computed from discharge over the dam, using the customary Francis weir formula with modified coefficient, and the quantities passing through the various wheels of the power house, which have been thoroughly rated.

Winter flow.—Little affected by ice.

Regulation.—The storage in the Rangeley system of lakes at the headwaters of Androscoggin River, aggregating 28,000,000,000 cubic feet, is largely under complete control. The stored water is regulated in the interests of the water-power users below and is under such excellent management that this is one of the best water-power streams in the country.

Accuracy.—Results excellent.

Cooperation.—Records are obtained and computations made by Mr. Charles A. Mixer, engineer Rumford Falls Power Co., who furnishes the data.

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Daily discharge, in second-feet, of Androscoggin River at Rumford Falls, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,990	3,450	2,350	14,700	9,140	7,710	2,380	2,120	1,260	1,850	3,240	2,670
2	2,820	3,000	2,050	10,800	8,430	7,470	2,370	1,960	1,950	2,520	2,820	2,550
3	3,030	3,120	2,390	8,560	8,370	7,130	2,370	1,890	1,950	7,180	2,880	2,560
4	3,690	3,030	2,510	7,630	7,780	6,460	1,610	2,120	1,740	3,880	2,770	2,620
5	3,200	2,740	2,450	8,310	7,300	6,510	1,510	2,350	1,590	2,790	2,770	2,790
6	3,000	2,610	2,410	8,720	7,040	5,530	1,610	2,240	1,710	2,580	2,710	2,670
7	3,000	2,550	2,400	7,750	6,360	4,600	2,420	2,220	1,380	2,350	2,680	2,210
8	2,890	2,480	2,420	7,080	5,530	4,160	2,370	2,010	1,750	2,280	2,590	3,320
9	2,520	2,380	1,990	6,650	4,790	4,020	2,130	1,800	1,930	2,210	6,980	2,810
10	2,520	2,460	2,210	6,120	4,250	3,740	2,600	1,600	1,860	2,110	22,000	2,430
11	2,790	2,490	2,580	6,250	3,510	3,620	3,480	2,280	1,830	2,020	9,450	2,970
12	2,560	2,220	2,580	6,690	3,300	3,340	2,680	2,090	1,720	2,160	5,160	2,500
13	2,840	2,410	2,630	7,150	3,340	3,300	1,880	2,140	1,680	2,760	4,030	2,980
14	2,770	2,470	2,750	7,780	3,120	3,210	2,490	2,050	1,650	2,450	3,590	3,020
15	2,740	2,480	4,590	9,080	2,970	2,310	2,500	2,060	1,710	2,530	3,240	2,960
16	2,780	2,520	7,250	9,300	3,040	2,080	2,140	2,090	1,910	2,750	2,720	2,680
17	2,760	2,530	5,920	9,200	3,150	2,600	2,160	1,540	1,730	2,910	2,870	2,770
18	2,850	2,520	4,120	7,910	2,320	2,700	2,300	2,220	1,720	2,780	2,990	2,940
19	3,390	2,460	4,240	8,010	2,500	2,720	2,160	2,280	1,690	2,410	2,950	2,240
20	3.710	2,440	5,210	8,480	3,110	2,690	1,850	2,070	1,710	6,500	3,320	2,220
21	3.650	2,460	9,180	6,850	3,000	2,590	2,160	2,050	1,540	13,800	3,750	2,460
22	4,030	2,500	15,900	6,360	3,060	1,800	2,320	1,920	3,560	5,870	3,170	2,570
23	3,880	2,300	10,500	6,400	4,250	2,370	2,190	1,900	8,490	4,020	2,770	2,360
24	3,660	2,430	8,400	7,980	6,830	2,400	2,090	1,560	3,490	3,040	2,580	1,880
25	3,520	2,360	13,500	9,310	7,450	2,470	2,080	1,960	2,670	3,370	2,770	2,080
26	3,090	2,280	19,100	10,700	6,620	2,540	2,230	2,080	2,180	3,680	2,770	2,250
27	3,230	2,360	13,800	10,400	5,420	2,510	1,940	1,900	2,070	6,400	2,760	2,240
28	3,120	2,360	16,900	10,000	4,690	2,660	2,250	1,960	1,570	4,730	2,520	2,060
29	2,900	.....	12,200	10,300	8,090	1,890	2,360	1,950	1,880	3,860	2,590	2,050
30	2,750	.....	9,350	9,910	9,080	2,450	2,280	1,960	1,880	3,560	2,400	2,280
31	2,740	.....	11,600	.....	8,410	.....	2,270	1,480	.....	3,420	.....	2,330

Monthly discharge of Androscoggin River at Rumford Falls, Maine, for 1913.

[Drainage area, 2,090 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	4,030	2,520	3,060	1.47	1.70
February	3,450	2,220	2,550	1.22	1.27
March	19,100	1,990	6,630	3.17	3.65
April	14,700	6,120	8,480	4.06	4.53
May	9,140	2,320	5,360	2.56	2.95
June	7,710	1,800	3,650	1.75	1.95
July	3,480	1,510	2,230	1.07	1.23
August	2,350	1,480	2,000	.957	1.10
September	8,490	1,260	2,130	1.02	1.14
October	13,800	1,850	3,700	1.77	2.04
November	22,000	2,400	4,010	1.92	2.14
December	3,320	1,880	2,530	1.21	1.40
The year	22,000	1,260	3,860	1.85	25.11

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PRESUMPSCOT RIVER BASIN.

PRESUMPSCOT RIVER AT OUTLET OF SEBAGO LAKE, MAINE.

Location.—At outlet dam at Sebago Lake and the hydroelectric plant at Eel Weir Falls, 1 mile below lake outlet.

Records available.—January 1, 1887, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission, in the second of which reports are published results of a recomputation of all data from 1887 to 1911.

Drainage area.—436 square miles.

Gages.—On the bulkhead of the gatehouse at the outlet dam and in the fore bay and tailrace of the power plant.

Discharge.—Prior to March, 1904, the discharge was determined from records of the opening of the gates in the dam. Since March, 1904, flow from the lake has been recorded by three Allen meters, one on each of three pairs of 30-inch Hercules wheels; wheels and recording meters checked by current-meter measurements, brake tests of wheels, and electrical readings of the generator output.

Winter flow.—Not affected by ice.

Regulation.—Sebago Lake, with an area of 46 square miles, is under complete control for storage.

Accuracy.—Results very good for a station of this type.

Cooperation.—Records obtained and computations of daily discharge made and furnished by the S. D. Warren Co.

Daily discharge, in second-feet, of Presumpscot River at outlet of Sebago Lake, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	683	630	792	695	667	a235	660	663	658	665	682	668
2	735	a410	a230	743	667	672	660	650	653	655	a395	670
3	563	803	802	562	667	668	665	a280	672	665	842	667
4	517	802	803	662	a223	668	257	672	670	662	820	663
5	a332	800	802	558	665	665	523	667	668	a163	752	675
6	670	823	800	a210	667	673	a227	672	662	665	838	567
7	680	823	800	620	670	670	672	673	a265	665	750	a212
8	745	803	800	637	663	a262	662	662	633	665	667	538
9	767	a283	a247	600	667	675	658	663	600	665	a217	638
10	800	792	800	667	660	667	670	a208	602	665	603	672
11	787	800	805	672	a223	670	665	620	647	663	735	667
12	a240	805	810	595	662	668	653	660	673	a210	755	672
13	803	807	763	a165	663	668	a295	662	668	663	670	625
14	803	805	538	557	665	672	668	660	a245	662	670	a235
15	813	792	385	547	668	a332	667	660	673	663	663	667
16	808	a367	a80	643	667	668	667	653	677	662	a223	675
17	682	803	588	663	650	628	672	a618	668	665	667	673
18	542	802	662	663	a238	633	660	667	675	672	672	667
19	a233	803	667	643	668	667	665	672	675	a222	610	677
20	650	803	598	a383	668	665	a220	665	675	675	815	668
21	667	800	523	667	663	660	668	655	a332	548	667	a202
22	667	742	410	667	665	a228	665	670	680	623	597	678
23	632	a238	a188	660	670	645	662	657	670	670	a240	673
24	532	800	553	657	618	672	667	a383	668	675	672	665
25	528	805	555	668	a217	665	663	667	677	577	675	600
26	a243	800	375	668	608	662	650	657	670	a310	672	343
27	672	803	393	a240	668	668	a228	667	672	417	602	470
28	742	800	467	665	668	665	665	665	a258	427	667	a235
29	803	.....	555	657	548	a235	655	667	670	673	567	670
30	807	.....	a337	657	420	663	667	662	665	675	a113	672
31	807	.....	595	.....	615	.....	665	a408	.....	672	.....	672

a Sunday.

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Monthly discharge of Presumpscot River at outlet of Sebago Lake, Maine, for 1913.

[Drainage area, 436 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	813	233	644	1.48	1.71
February	823	238	727	1.67	1.74
March	810	80	572	1.31	1.51
April	743	165	590	1.35	1.51
May	670	217	592	1.36	1.57
June	673	228	596	1.37	1.53
July	672	220	592	1.36	1.57
August	673	208	616	1.41	1.63
September	680	245	611	1.40	1.56
October	675	163	586	1.34	1.54
November	842	113	617	1.42	1.58
December	678	202	583	1.34	1.54
The year	842	80	610	1.40	18.99

SACO RIVER BASIN.

SACO RIVER AT WEST BUXTON, MAINE.

Location.—At hydroelectric plant of the Portland Electric Co., at West Buxton.

Records available.—October 19, 1907, to December 31, 1913. Data also in annual reports Maine State Water Storage Commission.

Drainage area.—1,550 square miles.

Gages.—One in pond above dam and one in tailrace of power house.

Channel and control.—Crest of the concrete dam, about 300 feet long.

Discharge.—Flow over the dam and through the rated wheels of the power plant is determined by means of gage readings taken every hour.

Winter flow.—Not affected by ice.

Regulation.—There are dams on numerous although comparatively small lakes in the basin above the station. Storage probably has some effect on the regimen of the stream, but not to the extent that obtains in the other basins in the State of Maine, where natural storage facilities are better and more fully developed.

Accuracy.—Results good for a station of this type.

Cooperation.—Records obtained and computations of daily discharge made and furnished by the Cumberland County Power & Light Co.

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Daily discharge, in second-feet, of Saco River at West Buxton, Maine, for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,610	2,590	1,600	14,000	5,410	4,710	1,360	984	401	1,810	5,240	2,980
2	2,710	1,970	1,400	12,900	5,370	4,760	1,320	962	669	1,680	4,720	2,740
3	2,760	2,590	1,860	12,200	5,110	4,330	1,020	871	703	1,930	4,860	2,690
4	2,380	2,340	1,640	11,700	4,560	4,130	928	849	739	2,410	4,500	2,530
5	3,090	2,170	1,520	11,700	4,820	3,780	795	770	662	2,630	4,150	2,630
6	3,510	2,320	1,660	11,100	4,440	3,620	859	962	466	3,340	3,910	2,480
7	3,180	2,290	1,670	10,600	4,200	3,300	1,130	1,040	418	3,370	3,650	2,150
8	3,010	2,160	1,400	9,780	4,040	2,630	1,360	907	595	3,170	3,760	3,550
9	2,790	1,810	1,190	9,090	3,870	2,980	1,170	873	595	2,880	3,110	3,450
10	2,650	2,490	1,380	12,500	3,700	2,730	1,110	867	576	2,770	4,920	3,280
11	2,580	2,510	1,590	7,600	3,200	2,620	1,010	854	563	2,460	5,010	3,110
12	2,220	2,300	1,440	7,440	3,430	2,420	869	839	533	2,000	6,130	3,100
13	2,650	2,310	1,720	7,030	3,050	2,430	845	765	385	2,560	6,710	2,640
14	2,450	1,630	2,270	7,540	2,600	2,230	1,040	763	291	2,430	6,800	2,130
15	2,360	1,640	4,310	7,320	2,970	1,720	1,240	594	483	2,070	6,670	2,630
16	2,400	1,120	2,650	7,250	2,950	2,210	1,230	442	548	2,090	6,070	2,310
17	2,450	2,000	6,690	7,140	2,720	2,030	1,060	588	533	2,290	6,010	2,510
18	2,840	1,680	5,830	6,030	2,350	1,820	1,090	311	545	2,170	5,530	2,710
19	2,850	1,570	5,430	6,620	2,870	1,630	905	640	490	1,960	5,030	2,890
20	3,200	1,620	6,180	6,580	2,610	1,910	843	514	412	2,750	4,810	2,680
21	3,180	1,610	7,720	6,650	2,550	1,300	825	655	373	2,760	4,540	2,230
22	3,290	1,650	9,740	6,340	2,480	1,360	828	624	759	3,340	4,320	2,670
23	3,210	1,620	8,760	6,690	2,380	1,780	854	461	1,040	4,620	3,520	2,380
24	3,230	1,900	11,700	5,690	2,630	1,910	906	294	1,160	4,810	4,380	1,870
25	3,240	1,780	12,400	5,810	3,240	1,390	971	526	2,650	4,480	3,860	1,590
26	2,760	1,740	13,500	5,200	4,260	1,510	969	514	2,560	4,840	3,660	2,290
27	3,220	1,940	14,000	4,870	4,180	1,340	885	574	2,420	5,880	3,410	1,840
28	2,890	1,650	15,500	5,300	3,970	1,250	1,040	527	1,900	5,910	3,420	1,590
29	2,760	.....	15,800	6,020	4,600	1,150	868	574	2,560	5,660	3,140	1,820
30	2,630	.....	15,700	5,630	5,330	1,360	763	593	1,910	5,640	2,430	1,610
31	2,540	.....	14,500	.....	5,230	.....	876	403	.....	5,620	.....	1,560

Monthly discharge of Saco River at West Buxton, Maine, for 1913.

[Drainage area, 1,550 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	3,510	2,220	2,830	1.83	2.11
February	2,590	1,120	1,960	1.26	1.31
March	15,800	1,190	6,220	4.01	4.62
April	14,000	4,870	8,140	5.25	5.86
May	5,410	2,350	3,710	2.39	2.76
June	4,760	1,150	2,410	1.55	1.73
July	1,360	763	999	.645	.74
August	1,040	294	682	.440	.51
September	2,650	291	931	.601	.67
October	5,910	1,680	3,300	2.13	2.46
November	6,800	2,430	4,610	2.97	3.31
December	3,550	1,560	2,470	1.59	1.83
The year	15,800	291	3,190	2.06	27.55

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MERRIMAC RIVER BASIN.

PEMIGEWASSET RIVER AT PLYMOUTH, N. H.

Location.—In the town of Plymouth, about three-fourths of a mile below Baker River.

Records available.—1886 to December 31, 1913.

Drainage area.—615 square miles.

Gages.—Staff gage since June 30, 1907; the low and medium stage sections about 40 feet above the bridge, the high-stage section bolted to the upstream side of the right abutment of the bridge. September 4, 1903, to June 30, 1907, chain gage on upstream side of highway bridge. The datum of the staff gage is 1.11 feet higher than that of the chain gage. All gage readings prior to 1910 refer to chain gage datum, later readings refer to staff gage datum. Gage read once daily.

Channel and control.—Two channels, the right rocky and practically permanent, the left fine gravel, shifting occasionally in high floods.

Discharge measurements.—Made from the bridge at ordinary and high stages. At low stages the right channel is measured from the bridge and the left channel by wading.

Regulation.—Low water flow affected by the operation of dams at Livermore Falls and at Woodstock.

Winter flow.—Affected by ice.

Cooperation:—Established in 1903 in cooperation with the New Hampshire Forestry Commission. Gage heights since June 30, 1907, furnished by the Locks & Canals Co., of Lowell, Mass.

The following discharge measurement was made by engineers of the Locks & Canals Co.:

August 20, 1913: Gage height, 0.104 feet; discharge, 200 second-feet.

Daily gage height, in feet, of Pemigewasset River at Plymouth, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	3.1	1.9	9.3	2.7	.....	0.6	0.45	−0.36	0.35	1.8	2.2
2	2.6	.....	.....	4.8	2.5	2.5	.6	.4	.1	.4	.....	1.15
3	2.5	3.5	1.9	3.5	2.2	2.1	.6	.....	.1	3.1	1.4	1.15
4	5.6	3.3	1.9	3.2	.....	2.0	.55	.4	.1	2.1	1.35	1.35
5	.....	3.2	1.9	3.4	2.1	1.8	.5	.5	.1	.....	1.25	1.3
6	3.3	2.8	1.8	.....	2.0	1.55	.....	.4	.1	1.2	1.2	1.25
7	3.1	2.5	1.8	3.0	1.9	1.4	.6	.4	.....	1.1	1.1	.....
8	3.1	2.5	1.8	2.9	1.8	.....	.55	.35	− .36	.9	1.15	2.4
9	3.2	.....	.....	2.3	1.8	1.2	.5	.35	− .46	.6	.....	2.3
10	3.4	2.3	1.7	2.1	1.6	1.15	.45	.....	− .46	.6	9.8	2.1
11	3.2	2.2	1.7	2.2	.....	1.1	1.25	.35	− .38	.6	4.6	2.0
12	.....	2.1	2.2	2.9	1.4	1.0	1.05	.3	− .56	.....	3.0	1.6
13	3.5	2.1	2.5	.....	1.3	.95	.....	.25	− .61	1.5	2.3	1.6
14	3.3	2.1	2.4	3.8	1.25	.9	.75	.25	.....	1.35	2.1	.....
15	3.0	2.2	6.4	4.1	1.2	.....	.7	.1	.05	1.25	1.9	1.6
16	2.9	.....	14.5	4.2	1.1	.85	.6	.1	.15	1.1	.....	1.6
17	3.1	2.1	11.3	3.6	1.4	.9	.55	.....	− .61	1.1	1.5	1.4
18	3.5	2.0	8.0	3.1	.....	1.2	.5	.1	− .46	1.0	1.5	1.25
19	.....	2.0	7.3	3.0	1.55	1.15	.....	.1	− .21	.....	1.4	1.3
20	4.7	1.9	8.4	.....	1.4	1.1	.....	.1	− .64	.95	2.2	1.7
21	3.4	2.0	15.0	2.5	1.15	1.0	.45	− .21	.....	7.2	2.6	.....
22	5.3	2.3	13.8	2.2	1.2	.....	.45	− .31	.2	3.3	2.1	1.6
23	4.2	.....	5.7	2.1	2.8	.9	.4	− .31	5.2	2.1	.....	1.4
24	3.7	2.1	4.6	2.8	4.1	.85	.4	.....	2.1	1.6	1.7	2.2
25	5.8	2.1	5.2	3.1	.....	.85	.4	.1	1.2	1.7	1.6	2.1
26	.....	2.0	12.3	3.8	3.1	.75	.4	.2	.85	.....	1.4	2.2
27	3.2	2.0	6.5	.....	2.6	.65	.....	.15	.7	3.9	1.3	2.0
28	2.9	1.9	15.4	3.3	2.2	.6	.35	.2	.....	3.1	1.2	.....
29	2.5	.....	7.0	3.2	5.0	.....	.6	.15	.55	2.2	1.2	2.1
30	2.2	.....	.....	3.4	4.5	.5	.55	.1	.35	2.1	.....	2.2
31	2.5	.....	3.8	.....	3.6	.....	.5	.....	.....	2.2	.....	2.2

NOTE.—Discharge relation Jan. 9 to Mar. 22 probably affected by ice. Discharge relation Mar. 23 to Apr. 1 may also be somewhat affected by ice.

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Daily discharge, in second-feet, of Pemigewasset River at Plymouth, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,780	.....	.....	13,100	2,120	2,530	425	352	105	409	1,260	1,620
2	2,020	.....	.....	4,760	1,920	1,920	425	330	216	330	1,100	765
3	1,920	.....	.....	3,020	1,620	1,530	425	330	216	2,560	945	765
4	6,000	.....	.....	2,660	1,580	1,440	400	330	216	1,530	908	908
5	4,390	.....	.....	2,900	1,530	1,260	375	375	216	1,160	835	870
6	2,780	.....	.....	2,670	1,440	1,060	400	330	216	800	800	835
7	2,560	.....	.....	2,440	1,350	945	425	330	160	730	730	1,320
8	2,560	.....	.....	2,340	1,260	872	400	309	105	600	765	1,820
9	.....	.....	.....	1,720	1,260	800	375	309	87	502	2,000	1,720
10	.....	.....	.....	1,530	1,100	765	352	309	87	425	14,200	1,530
11	.....	.....	.....	1,620	1,020	730	835	309	101	425	4,470	1,440
12	.....	.....	.....	2,340	945	665	698	288	71	722	2,440	1,100
13	.....	.....	.....	2,860	870	632	604	269	64	1,020	1,720	1,100
14	.....	.....	.....	3,380	835	600	510	269	132	908	1,530	1,100
15	.....	.....	.....	3,780	800	585	480	216	201	835	1,350	1,100
16	.....	.....	.....	3,920	730	570	425	216	233	730	1,180	1,100
17	.....	.....	.....	3,140	945	600	400	216	64	730	1,020	945
18	.....	.....	.....	2,560	1,000	800	375	216	87	665	1,020	835
19	.....	.....	.....	2,440	1,060	765	375	216	135	648	945	870
20	.....	.....	.....	2,180	945	730	364	216	60	632	1,620	1,180
21	.....	.....	.....	1,920	765	665	352	135	155	8,830	2,020	1,140
22	.....	.....	.....	1,620	800	632	352	114	250	2,780	1,530	1,100
23	.....	.....	6,160	1,530	2,230	600	330	114	5,360	1,530	1,360	945
24	.....	.....	4,470	2,230	3,780	570	330	165	1,530	1,100	1,180	1,620
25	.....	.....	5,360	2,560	3,170	570	330	216	800	1,180	1,100	1,530
26	.....	.....	.....	3,380	2,560	510	330	250	570	2,350	945	1,620
27	.....	.....	7,530	3,080	2,020	452	320	233	480	3,520	870	1,440
28	.....	.....	.....	2,780	1,620	425	309	250	440	2,560	800	1,480
29	.....	.....	8,450	2,660	5,060	400	425	233	400	1,620	800	1,530
30	.....	.....	6,420	2,900	4,330	375	400	216	409	1,530	1,210	1,620
31	.....	.....	3,380	.....	3,140	.....	375	160	.....	1,620	.....	1,620

NOTE.—Discharge determined from a rating curve well defined between 200 and 15,000 second-feet. Because of comparatively few discharge measurements in recent years the rating curve is somewhat uncertain. Discharge interpolated for days when no gage height was reported.

Monthly discharge of Pemigewasset River at Plymouth, N. H., for 1913.

[Drainage area, 615 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
April	13,100	1,530	3,010	4.89	5.46
May	5,060	730	1,740	2.83	3.26
June	2,530	375	833	1.35	1.51
July	835	320	417	.678	.78
August	375	114	252	.410	.47
September	5,360	60	439	.714	.80
October	8,830	330	1,450	2.36	2.72
November	14,200	730	1,760	2.86	3.19
December	1,820	765	1,240	2.02	2.33

MERRIMAC RIVER AT FRANKLIN JUNCTION, N. H.

Location.—At covered wooden bridge of the Boston & Maine Railroad near Franklin Junction, about a mile below the confluence of Pemigewasset and Winnepesaukee rivers.

Records available.—July 8, 1903, to December 31, 1913.

Drainage area.—1,460 square miles.

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Gage.—Chain fastened to floor of bridge on upstream side over the right-hand channel. A gage painted on the downstream right-hand side of the center pier is used by the United States Weather Bureau for high-water readings.

Channel and control.—Coarse gravel and bowlders; practically permanent.

Discharge measurements.—Made from upstream side of the bridge.

Winter flow.—Affected by ice.

Regulation.—Flow affected by storage in Winnepesaukee, Squam, and New Found lakes, and by the operation of mills above the station.

Accuracy.—Results fairly good for open-water periods.

Cooperation.—Data furnished by the Locks & Canals Co., of Lowell, Mass.

No discharge measurements made during 1913.

Daily discharge, in second-feet, of Merrimac River at Franklin Junction, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,362	3,490	1,582	14,220	4,360	.....	1,032	.....	.....	977	1,390	1,98
2	3,160	.....	.....	.....	4,045	5,270	900	.....	1,120	1,120	.....	2,12
3	3,200	3,160	1,615	6,605	3,787	4,540	925	.....	1,032	1,745	2,055	1,98
4	3,120	3,040	1,647	5,085	.....	4,180	.....	.....	1,032	1,712	1,915	1,95
5	.....	3,040	1,745	4,810	3,447	3,915	875	.....	977	.....	1,745	2,05
6	3,120	2,880	1,712	.....	3,320	3,702	.....	.....	950	1,392	1,615	1,98
7	3,447	2,492	1,582	4,180	3,280	3,617	1,712	.....	.....	1,120	1,582	.....
8	3,447	2,195	.....	4,090	3,040	.....	1,647	.....	977	1,090	1,615	3,74
9	3,405	.....	.....	3,915	2,960	3,532	1,360	.....	1,090	1,420	.....	4 00
10	2,570	1,810	.....	3,915	2,880	2,722	1,210	.....	977	1,452	10,440	1,74
11	2,342	1,777	.....	3,872	.....	2,417	1,330	1,330	950	1,390	6,800	1,45
12	.....	2,090	1,712	3,872	2,840	2,305	1,300	1,210	1,032	.....	6,125	2,41
13	2,305	1,985	1,452	.....	2,305	2,197	.....	1,180	977	1,360	3,745	2,30
14	2,267	1,845	2,535	3,872	2,125	1,950	1,360	1,150	.....	1,420	3,405	.....
15	2,305	1,615	4,900	4,855	2,055	.....	1,422	1,060	875	1,452	2,920	2,27
16	2,267	.....	.....	4,765	1,985	1,915	1,300	900	1,062	1,680	.....	2,19
17	2,342	1,582	10,860	4,450	1,915	1,845	1,120	.....	1,090	1,647	2,800	2,30
18	3,490	1,615	5,180	4,090	.....	1,745	1,090	950	1,180	1,240	2,530	2,05
19	.....	1,680	4,540	3,872	1,812	1,712	1,060	1,032	1,120	.....	2,342	1,84
20	4,360	1,582	6,320	.....	1,950	1,712	.....	1,060	1,240	1,210	2,267	1,58
21	4,405	1,615	11,910	3,830	1,847	1,582	1,032	1,090	.....	8,800	2,342	.....
22	4,050	1,582	24,930	4,045	1,810	.....	977	1,060	1,420	5,040	2,230	1,38
23	4,270	.....	.....	3,872	4,180	1,240	850	1,060	6,220	2,920	.....	1,33
24	3,830	1,452	5,840	3,745	4,405	1,330	875	.....	3,790	2,642	2,055	1,21
25	3,447	1,420	7,900	3,617	.....	1,270	1,090	1,120	2,020	2,195	2,160	1,61
26	.....	1,452	23,355	3,702	5,132	1,360	1,300	1,180	1,582	.....	2,195	1,39
27	2,920	1,485	13,695	.....	4,360	1,360	.....	1,150	1,452	4,585	2,020	1,33
28	2,570	1,680	27,765	3,745	3,660	1,210	1,090	1,120	.....	4,315	1,965	.....
29	2,230	.....	10,105	4,450	5,005	.....	.....	1,240	1,120	3,957	1,950	2,45
30	2,195	.....	.....	4,855	8,800	1,090	.....	1,330	1,005	3,447	.....	2,12
31	2,492	.....	6,220	.....	6,320	.....	.....	.....	.....	2,960	.....	1,89

Monthly discharge of Merrimac River at Franklin Junction, N. H., for 1913.

[Drainage area, 1,460 square miles.]

Month.	Discharge in second-feet.		Run-off (depth in inches on drainage area).
	Mean.	Per square mile.	
January	3,071	2.10	2.42
February	2,023	1.39	1.45
March	7,787	5.33	6.14
April	4,653	3.19	3.56
May	3,468	2.38	2.74
June	2,389	1.64	1.83
July	1,168	.800	.92
August	1,123	.770	.89
September	1,452	.995	1.11
October	2,381	1.63	1.88
November	2,889	1.98	2.21
December	2,029	1.39	1.60
The year	2,890	1.98	26.75

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MERRIMAC RIVER AT GARVINS FALLS, N. H.

Location.—At the dam of the Manchester Traction, Light & Power Co., 4 miles below Concord.

Records available.—1904 to 1913.

Drainage area.—2,340 square miles.

Winter flow.—Somewhat affected by ice.

Accuracy.—Results good.

Cooperation.—Data furnished by French & Hubbard, consulting engineers, Boston, Mass.

Daily discharge, in second-feet, of Merrimac River at Garvins Falls, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,744	5,272	2,676	15,456	6,452	8,936	1,668	1,758	1,015	1,832	3,425	2,602
2	7,482	5,342	3,013	16,573	5,380	7,551	1,765	1,506	1,208	2,233	2,885	2,751
3	6,725	5,687	2,969	12,040	4,991	6,257	1,864	995	960	1,625	2,910	2,651
4	7,644	4,840	3,127	9,587	4,463	5,560	1,434	1,432	1,449	3,956	2,730	2,818
5	9,894	4,520	2,980	9,075	4,416	5,056	1,507	1,195	1,308	3,140	2,622	3,059
6	8,836	4,406	2,835	9,659	4,230	4,432	1,061	1,901	1,240	2,364	2,721	3,122
7	7,151	3,931	2,699	9,070	4,206	4,091	2,248	1,786	1,079	2,293	2,611	2,527
8	6,751	4,010	2,636	7,617	4,010	3,682	2,676	1,389	1,234	2,246	2,554	3,488
9	4,650	3,981	2,761	6,553	3,636	3,496	2,619	1,771	1,327	2,109	1,884	5,566
10	4,904	3,985	2,698	5,976	3,341	3,163	2,128	1,011	1,389	2,076	3,068	4,089
11	5,008	3,436	3,783	5,599	2,542	3,025	2,354	1,449	1,432	1,630	10,020	4,257
12	5,117	3,159	3,978	6,751	2,863	2,854	2,299	1,508	1,339	918	6,441	3,144
13	5,248	3,189	4,440	8,017	2,869	2,728	1,747	1,334	1,252	1,148	4,841	3,349
14	5,310	3,121	5,018	9,161	2,825	2,455	2,098	1,572	995	2,724	3,934	2,934
15	5,330	3,063	9,651	9,464	3,916	2,131	2,188	1,633	1,245	2,524	3,562	3,086
16	4,895	3,387	17,707	9,152	2,461	2,049	2,074	1,480	1,188	2,370	3,123	2,294
17	4,876	3,933	18,844	8,607	2,599	2,068	2,090	981	1,059	2,197	3,071	3,123
18	5,206	3,839	11,905	7,316	2,542	2,177	1,944	1,197	1,317	2,090	3,204	3,041
19	5,822	2,767	8,650	6,588	2,546	3,360	1,719	1,158	1,578	1,518	2,976	1,829
20	8,817	3,014	8,220	6,246	2,677	7,267	1,100	1,184	1,031	2,133	2,949	2,451
21	8,060	3,904	13,016	6,476	2,509	7,811	1,631	1,328	1,025	2,812	3,876	2,018
22	7,924	3,376	20,974	5,444	2,516	7,986	1,793	1,338	1,044	5,710	3,977	2,633
23	7,906	4,625	22,719	5,157	2,837	6,446	1,790	1,405	2,038	3,609	3,141	2,776
24	6,949	4,208	12,315	4,768	5,809	1,908	1,831	948	2,850	3,310	3,126	2,202
25	6,951	3,644	13,787	5,299	8,448	1,864	1,841	924	2,059	2,288	3,067	2,345
26	6,546	3,047	20,077	5,518	8,768	1,827	1,531	991	2,566	2,664	2,983	2,274
27	5,903	2,670	24,196	5,935	7,219	1,728	1,019	1,417	2,190	3,926	2,501	2,368
28	5,348	2,516	28,041	5,844	5,798	1,692	1,705	1,428	1,561	4,927	2,608	2,065
29	4,656	.....	27,721	5,912	6,655	1,556	1,484	1,273	2,071	3,886	2,687	2,410
30	4,691	.....	17,737	6,819	12,837	1,636	1,667	1,389	1,939	3,294	2,079	2,534
31	4,581	.....	13,403	.....	11,810	.....	1,964	1,055	.....	3,373	.....	2,410

NOTE.—Discharge determined from records of flow over the dam and through the wheels of the power plant. See Water-Supply Paper 321, page 75, for description of this plant.

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Monthly discharge of Merrimac River at Garvins Falls, N. H., for 1913.

[Drainage area, 2,340 square miles.]

Month.	Drainage in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	9,894	4,581	6,320	2.70	3.11
February	5,687	2,516	3,818	1.63	1.70
March	28,041	2,636	10,792	4.61	5.32
April	16,573	4,768	7,856	3.36	3.75
May	12,837	2,461	4,780	2.04	2.35
June	8,936	1,556	3,893	1.66	1.85
July	2,676	1,019	1,833	.783	.90
August	1,901	924	1,345	.575	.66
September	2,850	960	1,464	.626	.70
October	5,710	918	2,675	1.14	1.31
November	10,020	1,884	3,385	1.45	1.62
December	5,566	1,829	2,896	1.24	1.43
The year	28,041	918	4,260	1.82	24.70

MERRIMAC RIVER AT LAWRENCE, MASS.

Location.—At the dam of the Essex Water Power Co. in Lawrence.

Records available.—January 1, 1890, to December 31, 1913.

Drainage area.—4,663 square miles. Run-off from 211 square miles in Sudbury and Cochituate River basins diverted, leaving effective drainage area 4,452 square miles.

Diversions.—Water is diverted from basins of Sudbury and Nashua rivers for use by the Metropolitan water district in Boston and vicinity, but during a part of the year water is wasted into the Merrimac at these diversion dams.

Accuracy.—Results good.

Cooperation.—Records furnished by R. A. Hale, principal assistant engineer of the Essex Water Power Co., and by the Metropolitan Water and Sewerage Board of Boston.

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Average weekly discharge, in second-feet, of Merrimac River at Lawrence, Mass., for 1913.

Weeks arranged in calendar order.		Weeks arranged in order of dryness at Lawrence.				
Week ending Sunday—	Merrimac River at Lawrence (total drainage area, 4,663 square miles).	Week ending Sunday—	Merrimac River at Lawrence (total drainage area, 4,663 square miles).	Wasting into Merrimac River from diverted drainage basins (211 square miles).	Net yield of Merrimac River from 4,452 square miles.	
					For week.	Per square mile.
	Sec.-ft.		*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*
Jan. 5	8,937	Aug. 31	1,130	10	1,120	0.252
12	7,973	Sept. 21	1,228	11	1,217	.273
19	6,847	Sept. 14	1,442	5	1,437	.323
26	8,876	Aug. 3	1,462	10	1,452	.326
Feb. 2	6,199	Aug. 17	1,465	8	1,457	.327
9	5,077	Aug. 24	1,471	17	1,454	.327
16	3,521	July 27	1,514	8	1,506	.338
23	3,040	Aug. 10	1,559	8	1,551	.348
Mar. 2	5,597	Sept. 7	1,629	10	1,619	.364
9	5,211	July 6	1,704	6	1,698	.381
16	10,152	July 20	1,894	7	1,887	.424
23	21,190	July 13	2,029	8	2,021	.454
30	26,447	Oct. 5	2,120	18	2,102	.472
Apr. 6	16,370	Oct. 19	2,210	19	2,191	.492
13	10,772	Sept. 28	2,462	16	2,446	.549
20	12,499	Oct. 12	2,473	12	2,461	.553
27	8,032	June 29	2,488	12	2,476	.556
May 4	7,885	June 22	2,659	18	2,641	.593
11	5,305	June 15	3,436	34	3,402	.764
18	3,795	Nov. 9	3,487	32	3,455	.776
25	5,120	Feb. 16	3,521	43	3,478	.781
June 1	11,922	Nov. 30	3,524	57	3,467	.779
8	6,668	Feb. 23	3,640	68	3,572	.802
15	3,436	May 18	3,795	30	3,765	.846
22	2,659	Nov. 23	4,093	46	4,047	.909
29	2,488	Dec. 7	4,110	67	4,043	.908
July 6	1,704	Dec. 28	4,159	117	4,042	.908
13	2,029	Dec. 21	4,265	54	4,211	.946
20	1,894	Oct. 26	4,473	38	4,435	.996
27	1,514	Feb. 9	5,077	71	5,006	1.124
Aug. 3	1,462	May 25	5,120	90	5,030	1.130
10	1,559	Mar. 9	5,211	129	5,082	1.142
17	1,465	May 11	5,305	52	5,253	1.180
24	1,471	Mar. 2	5,597	130	5,467	1.228
31	1,130	Nov. 2	6,193	63	6,130	1.377
Sept. 7	1,629	Feb. 2	6,199	86	6,113	1.373
14	1,442	Dec. 14	6,420	72	6,348	1.426
21	1,228	Nov. 16	6,486	47	6,439	1.446
28	2,462	June 8	6,668	47	6,621	1.487
Oct. 5	2,120	Jan. 19	6,847	114	6,733	1.512
12	2,473	May 4	7,885	114	7,771	1.746
19	2,210	Jan. 12	7,973	110	7,863	1.766
26	4,473	Apr. 27	8,032	153	7,879	1.770
Nov. 2	6,193	Jan. 26	8,876	104	8,772	1.970
9	3,487	Jan. 5	8,937	104	8,833	1.984
16	6,486	Mar. 16	10,152	150	10,002	2.247
23	4,093	Apr. 13	10,772	216	10,556	2.371
30	3,524	June 1	11,922	128	11,794	2.649
Dec. 7	4,110	Apr. 20	12,499	344	12,155	2.730
14	6,420	Apr. 6	16,370	224	16,146	3.627
21	4,265	Mar. 23	21,190	149	21,041	4.726
28	4,159	Mar. 30	26,447	315	26,132	5.870
52 weeks total	291,620	.....	291,620	3,801	287,819	64.648
Weekly average	5,608	.....	5,608	73	5,535	1.243

NOTE.—Discharge determined from records of flow over the dam and through the wheels of the power plant. Estimates of amounts wasted from Sudbury and Nashua drainage basins based on data furnished by the Metropolitan Water and Sewerage Board of Boston.

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Daily discharge, in second-feet, of Merrimac River at Lawrence, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9,087	5,066	4,557	17,983	9,170	11,599	2,619	1,818	492	1,939	3,910	5,071
2	10,140	5,300	6,124	20,604	8,111	10,178	2,589	1,183	2,809	2,102	3,516	4,142
3	9,490	7,152	7,074	17,063	6,771	8,278	2,407	160	2,421	2,724	5,332	3,973
4	9,877	6,086	6,415	14,120	5,924	7,215	600	1,817	2,195	1,899	4,226	4,125
5	11,233	5,726	5,965	12,483	6,846	6,531	526	1,880	2,070	1,439	3,845	4,490
6	11,727	5,177	5,662	12,578	5,990	5,965	580	1,854	1,243	3,986	3,612	3,256
7	9,570	4,838	4,981	13,075	5,793	4,495	3,112	1,897	171	3,211	3,634	3,715
8	8,899	3,149	3,392	11,785	5,501	4,014	2,708	1,962	1,783	2,873	2,458	6,435
9	6,974	3,409	2,988	10,486	5,369	5,378	2,501	1,306	1,788	2,333	1,301	7,992
10	6,471	5,393	6,200	9,480	3,972	4,153	2,151	198	1,760	2,625	4,980	8,310
11	6,045	4,320	6,306	8,947	3,662	3,736	1,909	1,966	1,758	2,021	10,092	7,062
12	6,137	3,448	7,167	9,499	5,530	3,605	1,574	1,743	1,790	260	9,799	6,273
13	7,737	3,513	8,112	12,129	4,205	3,585	247	1,730	1,098	688	7,054	4,607
14	7,019	3,688	8,086	14,511	3,688	2,270	2,185	1,746	114	3,084	5,808	4,259
15	6,974	2,553	12,493	14,723	3,258	1,325	2,319	1,828	1,548	3,068	4,295	6,059
16	6,637	1,731	22,790	13,997	4,123	3,898	2,227	1,076	1,482	3,183	3,371	5,026
17	6,330	4,871	27,272	13,112	2,657	3,282	2,257	166	1,460	2,932	5,402	4,615
18	5,914	3,872	21,775	11,783	3,104	2,769	2,399	1,687	1,412	2,155	4,377	4,677
19	7,321	3,517	16,896	10,225	5,006	2,737	1,626	1,678	1,485	371	3,642	4,088
20	9,849	3,314	14,756	9,141	3,724	2,851	247	1,750	1,046	2,995	3,685	2,763
21	9,882	3,192	16,910	9,827	3,742	2,460	2,132	1,826	161	3,731	4,030	2,024
22	9,277	1,984	23,190	8,643	3,881	621	1,956	1,816	1,591	5,228	3,818	5,136
23	9,161	4,749	27,538	8,114	4,185	4,141	1,864	1,234	1,904	6,568	3,695	4,234
24	8,530	7,094	20,547	7,678	4,806	3,063	1,640	303	3,110	5,136	5,341	4,022
25	7,983	6,336	16,431	7,790	10,494	2,689	1,699	1,417	4,713	3,322	4,373	2,435
26	7,448	5,405	19,380	7,076	12,365	2,024	1,206	1,379	3,495	4,333	3,773	6,024
27	8,142	4,647	31,321	7,097	10,877	2,477	99	1,315	2,123	8,190	1,350	3,973
28	6,982	5,015	34,757	8,220	9,188	2,036	1,834	1,333	296	8,063	4,725	3,290
29	6,240	.....	37,040	8,021	9,527	384	1,632	1,452	2,432	7,599	2,818	5,510
30	5,716	.....	25,651	8,976	14,790	2,598	1,780	859	2,304	6,402	2,288	4,476
31	5,447	.....	19,650	.....	15,105	.....	1,828	158	.....	5,649	.....	4,112

Monthly discharge of Merrimac River at Lawrence, Mass., for 1913.

Month.	Mean discharge of Merrimac River at Lawrence as measured (total drainage area, 4,663 square miles).	Wasting into Merrimac River from diverted drainage basins (211 square miles).	Average yield of Merrimac River from 4,452 square miles.		Run-off.		Rainfall.
			Mean.	Per square mile.	Depth in inches on drainage area.	Per cent of rainfall.	
	Sec.-ft.	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*			*Inches.*
January	8,007	106	7,901	1.775	2.046	73.3	2.79
February	4,465	70	4,395	.987	1.028	40.3	2.55
March	15,204	190	15,014	3.372	3.888	73.2	5.31
April	11,309	223	11,086	2.490	2.778	86.8	3.20
May	6,496	76	6,420	1.442	1.663	43.2	3.85
June	4,032	28	4,004	.899	1.003	90.4	1.11
July	1,757	8	1,749	.393	.453	18.6	2.44
August	1,372	10	1,362	.306	.353	11.5	3.07
September	1,735	11	1,724	.387	.432	12.9	3.36
October	3,552	30	3,522	.791	.912	15.7	5.81
November	4,352	45	4,307	.967	1.079	46.5	2.32
December	4,735	79	4,656	1.046	1.206	42.0	2.87
The year	5,565	73	5,512	1.238	16.84	46.2	38.68

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SOUHEGAN RIVER AT MERRIMAC, N. H.

Location.—At the head of Atherton Falls, below Stony Branch, and about 1½ miles above the junction of the Souhegan with Merrimac River.

Records available.—July 13, 1909, to December 31, 1913.

Drainage area.—168 square miles.

Gage.—Since October 15, 1913, a Gurley automatic water-stage register on the left bank about 350 feet above the falls, referred to a hook gage in the well; prior to April 11, 1911, a vertical staff on the left bank 40 feet above the falls; April 12, 1911, to October 14, 1913, a chain gage near the present location of the automatic gage and at the same datum.

Channel and control.—Control formed by the head of Atherton Falls; practically permanent.

Discharge measurements.—Made by wading below the falls at low stages and from cable at high stages.

Regulation.—Flow affected by the operation of mills at Milford, about 8 miles above.

Winter flow.—Not seriously affected by ice.

Floods.—The maximum discharge during 1913 occurred at about 9 a. m. March 28. Discharge approximately 3,650 second-feet, or 21.7 second-feet per square mile.

Accuracy.—Results good.

Cooperation.—Automatic gage maintained and record of gage heights furnished by the W. H. McElwain Co.

The following discharge measurement was made by G. H. Canfield by wading half a mile below gage:

October 14, 1913: Gage height, 2.53 feet; discharge, 84 second-feet.

Daily gage height, in feet, of Souhegan River at Merrimac, N. H., for 1913.

[R. J. Sylvester, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	3.2	4.0	4.6	3.45	3.4	2.27	2.42	2.24	2.34	3.11	2.84
2	3.9	3.15	3.8	4.4	3.4	3.1	2.30	2.47	2.26	2.33	2.95	2.98
3	3.75	3.1	3.7	3.9	3.0	3.1	2.27	2.31	2.34	3.74	2.94	3.12
4	4.7	2.98	3.45	3.85	3.05	3.0	2.25	2.51	2.26	3.26	2.96	3.36
5	4.2	2.91	3.35	3.8	2.96	2.94	2.26	2.51	2.30	3.18	2.94	3.23
6	3.7	3.0	3.25	3.8	2.94	2.86	2.22	2.73	2.31	2.78	2.91	3.14
7	3.6	2.94	3.25	3.85	2.98	2.70	2.28	2.33	2.26	2.64	2.94	3.04
8	3.55	2.51	2.90	3.8	2.94	2.62	2.16	2.13	2.20	2.54	2.78	4.05
9	3.35	2.44	3.1	3.65	2.85	2.63	2.12	2.50	2.26	2.53	2.77	3.87
10	3.25	2.32	3.5	3.55	2.76	2.60	2.12	2.14	2.20	2.54	4.15	3.61
11	3.3	2.74	3.65	3.55	2.59	2.60	2.44	2.16	2.18	2.59	3.83	3.47
12	3.5	2.72	3.5	4.3	2.84	2.44	2.48	2.12	2.22	2.51	3.42	3.58
13	3.8	2.73	3.8	4.6	2.72	2.28	2.28	2.45	2.22	2.52	3.26	3.16
14	3.5	2.72	3.95	4.6	2.68	2.49	1.96	2.68	2.22	2.66	3.17	3.06
15	3.5	2.72	5.3	4.3	2.68	2.44	2.28	2.58	2.78	2.55	3.17	3.14
16	3.35	2.72	4.7	4.0	2.75	2.38	2.43	2.33	2.48	2.59	3.08	3.08
17	3.4	2.73	4.2	3.9	2.80	2.36	2.03	2.33	2.49	2.62	2.97	3.04
18	3.55	2.72	3.7	3.7	2.80	2.34	2.48	2.22	2.17	2.62	3.05	3.06
19	3.65	2.68	3.75	3.6	2.74	2.32	2.40	2.28	2.15	2.44	3.02	2.93
20	3.7	2.68	4.2	3.55	2.68	2.42	2.30	2.48	2.17	2.56	3.01	2.76
21	3.55	2.86	4.4	3.45	2.65	2.40	2.43	2.63	2.18	3.43	3.06	2.80
22	3.6	3.05	4.2	3.35	2.68	2.41	2.19	2.30	2.21	3.24	3.02	2.87
23	3.35	3.3	3.8	3.35	2.82	2.35	2.14	2.40	3.3	3.00	2.90	2.89
24	3.75	3.55	3.9	3.2	3.8	2.42	2.25	2.46	2.84	2.88	2.80	2.99
25	3.7	3.15	3.85	3.1	3.95	2.39	2.38	2.43	2.81	2.94	2.87	3.27
26	3.6	3.1	4.4	3.2	3.65	2.36	2.53	2.33	2.55	4.4	2.80	3.18
27	3.45	3.05	5.4	3.1	3.35	2.36	2.28	2.73	2.37	4.2	2.75	3.19
28	3.3	3.15	7.3	3.05	3.2	2.30	2.32	2.43	2.40	3.73	2.70	2.86
29	3.3	.....	5.3	3.55	4.4	2.32	2.45	2.63	2.20	3.48	2.80	2.86
30	3.3	.....	4.8	3.55	4.4	2.22	2.30	2.24	2.32	3.32	2.80	2.98
31	3.2	.....	4.3	.....	3.65	.....	2.51	2.23	.....	3.20	.....	.....

NOTE.—Gage heights from Jan. 1 to Oct. 14 are means of two readings a day. Beginning Oct. 15, gage heights are means of 24 hourly values, obtained by Gurley automatic water-stage register.

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Daily discharge, in second-feet, of Souhegan River at Merrimac, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,030	311	710	1,100	424	400	45	68	42	55	264	169
2	653	290	599	960	400	269	49	77	44	54	207	218
3	572	269	546	653	355	269	45	50	55	567	204	268
4	1,170	223	424	626	250	230	43	85	44	337	211	280
5	830	198	378	599	216	208	44	85	49	303	204	315
6	546	230	333	599	208	181	39	140	50	155	193	276
7	496	208	333	626	223	131	47	54	44	115	169	239
8	472	85	194	599	208	110	33	31	37	92	149	750
9	378	72	269	421	278	113	30	83	44	90	146	642
10	333	52	447	472	149	105	30	32	37	92	810	505
11	335	143	521	472	103	105	72	33	35	103	618	435
12	447	137	447	895	174	72	79	30	39	85	410	490
13	599	140	599	1,100	137	47	47	74	39	87	330	284
14	447	137	682	1,100	126	81	19	126	39	121	288	246
15	447	137	1,630	895	126	72	47	101	155	90	288	276
16	378	137	1,170	710	146	61	70	54	79	98	235	253
17	400	140	830	653	161	58	23	54	81	105	214	239
18	472	137	546	546	161	55	79	39	34	105	242	246
19	421	126	572	496	143	52	64	47	32	68	232	200
20	546	126	830	472	126	68	49	79	34	92	228	143
21	472	181	960	424	118	64	70	113	35	415	246	155
22	496	250	830	378	126	66	36	49	38	320	232	179
23	378	355	599	378	168	56	32	64	355	225	190	196
24	572	472	653	311	599	68	43	75	174	183	155	221
25	546	290	626	269	682	62	61	70	164	204	179	335
26	496	269	960	311	521	58	90	54	94	960	155	292
27	424	250	1,710	269	378	58	47	140	60	840	140	296
28	355	290	3,450	250	311	49	52	70	64	565	125	176
29	355	.....	1,630	472	960	52	74	113	37	440	155	176
30	355	.....	1,240	472	960	39	49	42	52	360	155	218
31	311	.....	895	.....	421	.....	85	41	.....	300	.....	200

NOTE.—Discharge determined from a well-defined rating curve. Discharge Dec. 31 estimated.

Monthly discharge of Souhegan River at Merrimac, N. H., for 1913.

[Drainage area, 168 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area)	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	1,170	311	508	3.02	3.48	A.
February	472	52	202	1.20	1.25	A.
March	3,450	194	826	4.92	5.67	A.
April	1,100	250	584	3.46	3.86	A.
May	960	103	299	1.78	2.05	A.
June	400	39	109	.649	.72	A.
July	90	19	51.4	.306	.35	B.
August	140	30	70.1	.417	.48	B.
September	355	32	69.5	.414	.46	B.
October	960	54	246	1.46	1.68	A.
November	810	125	246	1.46	1.63	A.
December	750	143	291	1.73	1.99	A.
The year	3,450	19	293	1.74	23.62	

SOUTH BRANCH OF NASHUA RIVER (WACHUSETT DRAINAGE AREA) AT CLINTON, MASS.

Location.—At Wachusett dam, above Clinton.

Records available.—July, 1896, to December, 1913.

Drainage area.—118.19 square miles.

Regulation.—Flow affected by storage in reservoirs and mill ponds and especially by storage in Wachusett reservoir. Results corrected for storage.

Cooperation.—Data furnished by the Metropolitan Water & Sewerage Board, Boston, Mass.

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Yield and rainfall in South Branch of Nashua River basin (Wachusett drainage area) at Clinton, Mass., for 1912, and summary for 1897–1913.

[Drainage area, 118.19 square miles.]

Month.	Total yield in million gallons.	Average yield per square mile.		Rainfall in inches.[a]	Rainfall collected.	
		Million gallons per day.	Second-feet.		Inches.[a]	Per cent.
1913.						
January	5,180.7	1.414	2.188	3.38	2.522	74.7
February	2,869.4	.867	1.342	2.55	1.397	54.7
March	8,200.5	2.263	3.501	5.58	4.037	72.4
April	7,387.1	2.063	3.224	3.90	3.597	92.2
May	3,804.8	1.038	1.607	3.71	1.852	49.9
June	992.4	.280	.433	.90	.483	53.5
July	70.1	.019	.030	2.37	.034	1.4
August	218.8	.060	.092	3.05	.107	3.5
September	775.1	.219	.338	4.44	.377	8.5
October	2,484.2	.678	1.049	6.02	1.209	20.1
November	2,339.9	.660	1.021	2.59	1.139	43.9
December	3,499.8	.955	1.478	2.73	1.704	62.5
The year	37,912.8	.879	1.360	41.22	18.458	44.8
SUMMARY, 1897–1913.						
January	74,621.4	1.198	1.854	3.65	2.137	58.5
February	77,379.0	1.367	2.115	3.73	2.216	59.4
March	166,499.2	2.673	4.135	4.38	4.768	108.8
April	129,866.8	2.154	3.333	3.88	3.719	95.9
May	73,638.0	1.182	1.829	3.48	2.109	60.6
June	45,225.2	.750	1.161	3.64	1.295	35.5
July	23,409.6	.376	.581	3.92	.671	17.1
August	23,762.2	.382	.590	4.15	.681	16.4
September	21,651.7	.359	.556	3.81	.620	16.3
October	33,153.7	.352	.823	3.56	.949	26.7
November	48,206.5	.800	1.237	3.43	1.381	40.2
December	75,636.0	1.214	1.878	4.21	2.166	51.5
The year	793,049.3	1.081	1.672	45.84	22.712	49.5

[a] For 1913, total for month; 1897–1913 average of totals for calendar month.

SUDBURY RIVER AT FRAMINGHAM AND LAKE COCHITUATE AT COCHITUATE, MASS.

Location.—On Sudbury River at Framingham and on Lake Cochituate at Cochituate.

Records available.—Sudbury River and Lake Cochituate have been studied by the engineers of the city of Boston, the State Board of Health of Massachusetts, and the Metropolitan Water & Sewerage Board; records of rainfall have been kept in the Sudbury basin since 1875 and in the Cochituate basin since 1852, but the latter are considered of doubtful accuracy previous to 1872.

Storage reservoirs.—The greater part of the flow from these basins is controlled by storage reservoirs constructed by the city of Boston and the Metropolitan Water and Sewerage Board. Lake Cochituate, which drains into Sudbury River a short distance below Framingham, is controlled as a storage reservoir by the Metropolitan Waterworks. In the Sudbury River basin the water surfaces exposed to evaporation have been increased from time to time by the construction of additional storage reservoirs. From 1875 to 1878, inclusive, the water surface amounted to 1.9 per cent of the total area; from 1879 to 1884, to 3 per cent; 1885 to 1893, to 3.4 per cent; 1894 to 1897, to 3.9 per cent; 1898 and subsequent years, 6.5 per cent.

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Determinations of discharge.—In determining the run-off of the Sudbury and Cochituate drainage areas the water diverted for the municipal supply of Framingham, Natick, and Westboro, which discharge their sewerage outside the basins, is taken into consideration; the results, however, are probably less accurate since the sewerage diversion works were constructed. The public water and sewerage works were installed in these towns as follows:

Dates of installation of water and sewerage works in Framingham, Natick, and Westboro.

Town.	Water supply.	Sewerage works.
Framingham	1885	1899
Natick	1874	1896
Westboro	1879	1892

Water from the Wachusett drainage area also passes into the reservoirs in the Sudbury basin and must be measured to determine the yield of the Sudbury basin; the small errors unavoidable in the measurement of large quantities of water decrease the accuracy of the estimates of the Sudbury water supply during months of low yield for years subsequent to 1897.

Cooperation.—Data furnished by the Metropolitan Water & Sewerage Board, Boston, Mass.

Yield and rainfall in Sudbury River basin at Framingham, Mass., for 1913, and summary for 1875–1913.

(Drainage area, 75.2 square miles.)

Month.	Total yield, in million gallons.	Average yield per square mile.		Rainfall in inches.[a]	Rainfall collected.	
		Million gallons per day.	Second-feet.		Inches.[a]	Per cent.
1913.						
January	2,427.2	1.041	1.611	3.17	1.857	58.5
February	1,587.3	.754	1.166	2.82	1.215	43.1
March	4,871.4	2.090	3.233	5.75	3.727	64.8
April	5,634.5	2.232	3.453	4.25	3.852	90.6
May	2,021.4	.867	1.342	3.97	1.547	39.0
June	335.6	.149	.230	1.98	.257	13.0
July	−145.2	−.062	−.096	3.60	−.111	−3.1
August	−124.8	−.054	−.083	3.64	−.095	−2.6
September	198.5	.088	.136	3.77	.152	4.0
October	1,127.9	.484	.749	5.53	.863	15.6
November	1,082.7	.480	.743	2.65	.828	31.3
December	1,705.6	.732	1.132	3.18	1.305	41.1
The year	20,122.1	.733	1.134	44.31	15.397	34.8
SUMMARY, 1875–1913.						
January	108,373.6	1.192	1.844	4.08	2.126	52.1
February	140,447.0	1.696	2.624	4.13	2.756	66.7
March	252,764.6	2.780	4.300	4.46	4.959	111.2
April	176,123.0	2.002	3.097	3.54	3.456	97.7
May	96,615.3	1.062	1.644	3.33	1.895	57.0
June	42,986.1	.489	.756	3.03	.843	27.8
July	13,963.8	.154	.238	3.55	.274	7.7
August	20,599.6	.227	.351	3.85	.404	10.5
September	20,659.9	.225	.363	3.46	.405	11.7
October	39,849.4	.438	.678	3.92	.782	19.9
November	68,540.8	.779	1.205	3.82	1.345	35.2
December	90,457.4	.995	1.539	3.82	1.775	46.4
The year	1,071,380.5	1.000	1.548	44.99	21.020	46.7

[a] For 1913, total for month; 1875–1913, average of totals for calendar month.

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Yield and rainfall in Lake Cochituate basin at Cochituate, Mass., and summary for 1863–1913.

[Drainage area 17.58 square miles.]

Month.	Total yield in million gallons.	Average yield per square mile.		Rainfall in inches.[a]	Rainfall collected.	
		Million gallons per day.	Second-feet.		Inches.[a]	Per cent.
1913.						
January	593.4	1.089	1.685	2.89	1.94	67.2
February	406.6	.826	1.278	2.80	1.33	47.5
March	1,100.9	2.020	3.126	5.59	3.60	64.5
April	1,055.1	2.001	3.059	4.05	3.45	85.3
May	503.5	.924	1.429	3.70	1.65	44.5
June	128.1	.243	.376	.86	.42	48.8
July	−3.8	−.007	−.011	3.03	−.01	−.4
August	100.0	.183	.284	4.36	.33	7.5
September	167.3	.317	.491	3.67	.55	14.9
October	304.1	.558	.863	5.80	1.00	17.2
November	258.2	.490	.757	2.23	.84	37.9
December	468.2	.859	1.329	3.05	1.53	50.2
The year	5,081.6	.792	1.225	42.03	16.63	39.6
1863–1913.						
January	30,443.7	1.096	1.694	3.89	1.96	50.3
February	38,353.4	1.515	2.344	3.92	2.46	62.8
March	59,871.3	2.154	3.332	4.36	3.84	88.2
April	45,067.5	1.676	2.592	3.61	2.89	80.1
May	26,428.5	.951	1.471	3.61	1.70	46.9
June	12,124.1	.451	.697	2.95	.78	26.3
July	7,430.0	.267	.414	3.90	.48	12.2
August	10,751.6	.387	.598	4.14	.69	16.6
September	11,100.9	.413	.639	3.54	.71	20.1
October	14,998.8	.540	.835	4.14	.96	23.3
November	20,599.2	.766	1.185	4.00	1.32	33.1
December	25,516.6	.918	1.420	3.58	1.64	45.8
The period	302,685.6	.924	1.430	45.64	19.43	42.6

[a] For 1913, total for month; 1863–1913, average of totals for calendar month.

BLACKSTONE RIVER BASIN.

BRANCH RIVER AT BRANCH VILLAGE, R. I.

Location.—At Branch Village, just below the mill of James Pitts & Sons, three-quarters of a mile from Forestdale and about 2 miles from Woonsocket.

Records available.—September 2, 1909, to July 28, 1913.

Drainage area.—93 square miles.

Gages.—Staff, bolted to a ledge about 500 feet below the dam and mill; also a chain gage attached to a tree on top of the ledge. Gage heights referred to the staff gage.

Channel and control.—Section smooth and practically permanent.

Discharge measurements.—Made from the bridge above the dam, from a boat, or by wading.

Regulation.—Flow affected by the operation of the mill directly above the station and also by one farther up the river. The available storage above the Pitts Mill is small and water passes over the dam much of the time.

Winter flow.—Affected by ice only in severe weather.

Cooperation.—Gage heights furnished by James Pitts & Sons, Branch Village, R. I.

Estimates of discharge withheld on account of diurnal fluctuation.

No discharge measurements made during 1913.

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Daily gage height, in feet, of Branch River at Branch Village, R. I., for 1913.

Day.	Jan.		Feb.		Mar.		Apr.		May.		June.		July.	
	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.
1	2.7	2.9	1.4	1.8	2.5	2.5	2.65	3.0	2.1	2.4	a1.55	a1.55	1.1	1.35
2	2.6	2.4	a1.3	a1.3	a2.35	a2.35	2.5	2.65	2.0	2.3	1.55	2.2	1.1	1.7
3	2.7	2.4	1.3	2.5	2.3	2.45	2.4	2.5	1.9	1.8	1.55	2.2	1.1	1.45
4	2.7	2.3	1.35	2.4	2.0	2.4	2.1	2.45	a1.75	a1.75	1.3	1.65	1.05	1.1
5	a2.0	a2.0	1.35	2.3	1.9	2.4	2.05	2.0	1.7	2.25	1.35	1.65	1.1	1.05
6	1.9	2.3	1.7	2.35	1.9	2.45	a2.05	a2.05	1.7	2.3	1.35	1.8	a.9	a.63
7	1.65	2.3	1.25	2.25	1.95	2.4	2.1	2.4	1.1	2.25	1.3	1.7	.65	1.5
8	1.9	2.6	1.2	1.6	1.8	1.7	2.05	2.4	1.1	2.15	a1.25	a1.25	.7	1.65
9	2.5	2.8	a1.3	a1.25	a1.8	a1.8	1.95	2.3	1.05	2.0	1.3	2.1	.6	1.45
10	2.4	2.5	1.25	2.4	1.8	2.35	1.95	2.4	1.2	1.6	1.25	2.1	.7	1.8
11	2.5	2.2	1.3	2.3	1.85	2.4	1.8	2.35	a1.05	a1.05	1.25	1.9	.75	1.6
12	a2.5	a2.5	1.0	2.1	2.0	2.4	2.4	2.7	1.1	2.2	1.2	1.25	1.65	1.65
13	2.4	2.6	.9	2.2	2.0	2.35	a4.3	a4.35	1.1	2.25	1.15	1.45	a.9	a.9
14	2.4	2.4	.95	2.1	1.9	2.55	4.4	3.85	.95	2.2	1.15	1.15	.65	1.6
15	2.2	2.4	.9	1.55	2.35	2.55	3.4	3.3	1.1	2.15	a1.15	a1.05	.65	1.5
16	1.5	2.4	a1.1	a1.1	a2.9	a2.9	3.0	3.7	1.1	1.9	1.15	2.0	.65	1.65
17	2.5	2.4	1.2	2.3	2.8	2.8	4.8	4.45	1.6	1.4	1.15	1.7	.65	1.8
18	2.5	2.4	1.2	2.25	2.4	2.6	3.7	3.4	a1.2	a1.2	1.1	1.6	1.65	1.6
19	a2.5	a2.5	1.0	2.1	2.2	2.45	3.1	3.0	1.25	2.0	1.1	1.8	.6	1.65
20	2.5	2.4	.85	2.1	2.1	2.6	a2.75	a2.75	1.3	2.15	1.15	1.8	(a)	(a)
21	2.6	2.4	1.0	2.15	2.6	3.0	2.7	2.8	1.2	2.2	1.15	1.15	.5	1.6
22	2.6	2.4	1.2	1.65	2.6	2.35	2.4	2.6	1.1	1.6	a1.0	a1.0	.65	1.8
23	2.6	2.4	a2.0	a2.1	a2.3	a2.3	2.25	2.5	1.4	2.0	1.0	1.7	.7	1.6
24	2.65	2.5	2.3	2.5	2.25	2.5	2.15	2.4	1.9	2.0	1.05	1.8	.65	1.4
25	2.45	2.1	2.0	2.4	1.9	2.45	2.0	2.4	a1.9	a1.9	1.1	1.8	.6	1.4
26	a2.0	a2.0	1.6	2.3	2.1	2.8	1.9	1.9	2.0	2.4	1.1	1.8	1.45	1.8
27	1.9	2.4	1.6	2.4	3.4	4.55	a1.8	a1.75	1.9	2.35	1.1	1.7	(a)	(a)
28	1.75	2.4	1.8	2.6	5.1	4.45	1.75	2.3	1.65	2.15	1.1	1.2	.....	1.75
29	1.75	2.3	.....	.....	3.7	3.4	1.4	2.15	1.4	2.2	a1.0	a1.0	.....	.....
30	2.6	2.35	.....	.....	a2.7	a2.65	1.0	2.1	1.45	1.5	1.05	1.4	.....	.....
31	1.4	2.3	.....	.....	2.6	2.85	.....	.....	1.5	1.5	.....	.....	.....	.....

a Sunday.

NOTE.—On week days gage was read at 6.30 a. m. and about 5 p. m. except Saturday, when the second reading was taken at 11.45 a. m. Sundays the gage was read at 7 a. m. and 5 p. m.

CONNECTICUT RIVER BASIN.

CONNECTICUT RIVER AT ORFORD, N. H.

Location.—At covered highway bridge between Orford, N. H., and Fairlee, Vt.; approximately 10 miles downstream (by river) from the mouth of Waits River.

Records available.—August 6, 1900, to December 31, 1913.

Drainage area.—3,300 square miles.

Gage.—Chain attached to the upstream side of the bridge.

Channel and control.—Channel wide and deep with gravelly bottom; slightly shifting.

Discharge measurements.—Open-water measurements made from downstream side of the covered bridge by working through open space near the roof.

Regulation.—Flow slightly affected by the operation of power plants above the station.

Winter flow.—Seriously affected by ice, but ice conditions unusually stable.

Discharge measurements of Connecticut River at Orford, N. H., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 10	C. S. De Golyer	a 5.52	1,420	Sept. 11	G. H. Canfield	2.47	604
Apr. 30	R. S. Barnes	11.65	10,900				

a Measurement made under complete ice cover 200 feet above gage.

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Daily gage height, in feet, of Connecticut River at Orford, N. H., for 1913.

[F. H. Gardner, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.5	9.7	.....	19.3	10.4	12.9	4.8	5.4	3.8	4.1	8.4	5.6
2	8.4	9.6	.....	18.3	9.6	11.1	4.4	5.0	3.6	3.1	7.7	5.8
3	8.3	8.8	.....	16.0	9.3	9.8	4.4	4.8	3.2	3.4	6.8	5.9
4	10.5	8.5	.....	14.4	9.0	9.1	3.8	4.6	3.0	4.0	6.6	6.0
5	10.6	8.0	.....	16.2	8.6	8.6	3.6	4.6	3.2	4.3	6.1	6.2
6	9.6	7.5	.....	17.2	8.5	8.0	4.1	4.5	2.9	4.8	6.0	6.0
7	9.8	7.0	.....	16.2	8.5	7.6	4.0	4.4	2.8	4.8	5.8	6.0
8	9.8	6.9	.....	13.9	8.0	7.4	4.0	5.0	2.8	4.6	5.8	6.0
9	9.6	6.8	.....	12.3	7.6	7.6	4.0	4.6	3.0	4.2	5.9	6.9
10	8.8	6.4	.....	11.2	7.2	7.6	4.0	4.6	2.6	3.6	7.8	7.8
11	7.8	6.4	.....	10.8	6.9	7.2	4.0	3.8	2.45	3.8	9.1	9.0
12	8.3	6.1	.....	11.0	6.8	6.8	.....	3.9	2.7	4.2	8.6	8.9
13	8.8	6.2	.....	10.8	6.8	6.6	.....	3.8	2.5	4.7	7.6	8.8
14	8.6	6.2	.....	11.8	6.8	6.2	.....	3.8	2.5	5.0	7.2	8.6
15	8.8	6.1	.....	12.0	6.6	5.9	.....	3.9	2.3	5.0	6.5	8.2
16	8.6	6.2	20.4	12.4	6.6	5.9	.....	3.5	2.5	5.0	6.0	7.8
17	8.6	6.1	20.4	12.6	6.6	6.0	4.8	3.9	2.7	4.8	5.8	7.5
18	10.2	6.0	18.0	12.8	6.6	6.2	4.8	3.6	2.6	4.8	5.8	7.1
19	13.2	6.0	15.8	12.3	6.7	6.4	5.0	3.5	2.7	4.8	5.6	6.8
20	13.8	5.9	15.8	12.6	7.0	6.1	5.0	3.2	2.6	4.8	5.7	6.2
21	14.4	6.0	18.4	12.4	7.2	5.8	5.0	2.8	2.8	6.8	7.1	6.0
22	14.2	6.4	21.8	12.0	7.0	5.6	5.2	2.9	3.0	7.7	8.6	6.0
23	13.6	.....	21.5	11.7	7.8	5.2	5.0	2.8	4.4	7.4	8.2	5.8
24	13.4	.....	19.4	11.5	11.2	5.0	4.6	2.4	5.2	6.6	7.3	5.7
25	12.8	.....	19.9	11.2	12.8	4.7	4.3	2.8	5.4	6.0	6.9	5.6
26	10.9	.....	25.6	11.8	11.8	4.5	4.2	3.3	5.6	6.9	6.7	5.4
27	10.5	29.6	29.4	12.4	10.2	4.6	4.6	3.2	4.8	8.8	6.4	5.4
28	9.8	33.1	32.9	12.2	9.2	4.8	5.1	2.8	4.2	10.2	6.0	5.6
29	9.0	.....	30.2	11.6	11.4	5.8	7.5	3.2	4.1	9.6	5.8	5.4
30	8.2	.....	25.8	11.3	14.5	5.2	7.0	2.8	3.4	8.6	5.6	5.4
31	8.4	.....	21.4	.....	13.6	.....	6.3	3.4	.....	8.4	.....	5.4

NOTE.—Discharge relation affected by ice Feb. 23 to Mar. 15, and Dec. 21-31.

Daily discharge, in second-feet, of Connecticut River at Orford, N. H., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,220	7,880	.....	25,200	8,880	12,800	2,110	2,650	1,360	1,500	6,100	2,850
2	6,100	7,740	.....	23,200	7,740	9,920	1,790	2,290	1,220	930	5,200	3,050
3	5,960	6,630	.....	18,500	7,320	8,020	1,790	2,110	980	1,100	4,050	3,160
4	9,030	6,220	.....	15,500	6,900	7,040	1,360	1,950	880	1,500	3,930	3,270
5	9,180	5,580	.....	18,900	6,360	6,360	1,220	1,950	980	1,710	3,380	3,490
6	7,740	4,960	.....	20,900	6,220	5,580	1,570	1,870	830	2,110	3,270	3,270
7	8,020	4,380	.....	18,900	6,220	5,080	1,500	1,790	780	2,110	3,050	3,270
8	8,020	4,160	.....	14,600	5,580	4,840	1,500	2,290	780	1,950	3,050	3,270
9	7,740	4,050	.....	11,800	5,080	5,080	1,500	1,950	880	1,640	3,160	4,160
10	6,630	3,710	1,420	10,100	4,610	5,080	1,500	1,950	685	1,220	5,330	5,330
11	5,330	3,710	.....	9,470	4,160	4,610	1,500	1,360	618	1,360	7,040	6,900
12	5,960	3,400	.....	9,770	4,050	4,050	.....	1,430	730	1,640	6,560	6,760
13	6,630	3,500	.....	9,470	4,050	3,930	.....	1,360	640	2,030	5,080	6,630
14	6,360	3,500	.....	11,000	4,050	3,490	.....	1,360	640	2,290	4,610	6,360
15	6,630	3,400	.....	11,300	3,930	3,160	.....	1,430	550	2,290	3,820	5,840
16	6,360	3,500	27,600	12,000	3,930	3,160	.....	1,160	640	2,290	3,270	5,330
17	6,360	3,400	27,600	12,300	3,930	3,270	2,110	1,430	730	2,110	3,050	4,960
18	8,600	3,290	22,500	12,600	3,930	3,490	2,110	1,220	685	2,110	3,050	4,500
19	13,300	3,290	18,200	11,800	4,040	3,710	2,190	1,160	730	2,110	2,850	4,050
20	14,400	3,190	18,200	12,300	4,380	3,380	2,290	980	685	2,110	2,950	3,490
21	15,500	3,290	23,400	12,000	4,610	3,050	2,290	780	780	4,050	4,500	3,160
22	15,200	3,710	30,600	11,300	4,380	2,850	2,470	830	880	5,200	6,360	2,950
23	14,000	.....	29,900	10,800	5,330	2,470	2,290	780	1,790	4,840	5,840	2,650
24	13,700	.....	25,400	10,500	10,100	2,290	1,950	595	2,470	3,930	4,720	2,470
25	12,600	.....	26,500	10,100	12,600	2,030	1,710	780	2,650	3,270	4,160	2,290
26	9,620	.....	38,900	11,000	11,000	1,870	1,640	1,040	2,850	4,160	4,040	2,030
27	9,030	.....	47,600	12,000	8,600	1,950	1,950	980	2,110	6,630	3,710	1,870
28	8,020	.....	56,000	11,600	7,180	2,110	2,380	780	1,640	8,600	3,270	1,950
29	6,900	.....	49,600	10,700	10,400	3,050	4,960	980	1,570	7,740	3,050	1,640
30	5,840	.....	39,400	10,200	15,700	2,470	4,380	780	1,100	6,360	2,850	1,570
31	6,100	.....	29,700	.....	14,000	.....	3,600	1,100	.....	6,100	.....	1,500

NOTE.—Discharge determined from a rating curve well defined below 30,000 second-feet. Mean discharge for frozen periods estimated by comparison with records on Connecticut River at Sunderland, Mass., as follows: Feb. 23-28, 4,500 second-feet; Mar. 1-9, 3,100 second-feet; Mar. 11-15, 9,200 second-feet. Mean discharge July 12-16, estimated 1,800 second-feet by interpolation. Daily discharge Dec. 21-31 estimated by hydrograph comparison with records at Sunderland.

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Monthly discharge of Connecticut River at Orford, N. H., for 1913.

[Drainage area, 3,906 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	15,500	5,330	8,740	2.65	3.06	A.
February	7,880	3,190	4,410	1.34	1.40	C.
March	.....	.....	18,980	5.73	6.61	C.
April	25,200	9,470	13,300	4.03	4.50	A.
May	15,700	3,930	6,750	2.05	2.36	A.
June	12,800	1,870	4,340	1.32	1.47	A.
July	4,960	1,220	2,090	.633	.73	A.
August	2,650	595	1,390	.421	.49	B.
September	2,850	550	1,130	.342	.38	B.
October	8,600	930	3,130	.948	1.09	A.
November	7,040	2,850	4,170	1.26	1.41	A.
December	6,900	1,500	3,680	1.12	1.29	A.
The year	.....	550	6,020	1.83	24.79	

CONNECTICUT RIVER AT SUNDERLAND, MASS.

Location.—At the five-span steel highway bridge at Sunderland, on the road leading to South Deerfield, about 18 miles in a direct line and 26 miles by river above the dam at Holyoke. Deerfield River enters the Connecticut from the west about 8 miles above the station.

Records available.—March 31, 1904, to December 31, 1913. From 1880 to 1899 records were obtained at Holyoke, Mass.

Drainage area.—7,700 square miles.

Gage.—Chain on highway bridge.

Channel and control.—Channel deep, with bottom of coarse gravel and alluvial deposits; no indications of any change in conditions at low stages. For high stages the control is evidently the crest of the dam at Holyoke.

Discharge measurements.—Made from highway bridge.

Regulation.—Flow affected by the operation of dams at Vernon, Vt., Turners Falls, Mass., and on Deerfield River, Millers River, and other tributaries.

Winter flow.—Occasionally affected by ice.

Floods.—The flood of March 26–31, 1913, reached its maximum stage during the night of March 28–29, as indicated by the records of the gage observer. Determinations made from high-water marks by engineers of the Geological Survey show the maximum gage height to have been 30.7 feet.

Accuracy.—Results good.

The following discharge measurement was made by C. H. Pierce:

August 10, 1913: Gage height, 2.54 feet; discharge, 2,940 second-feet.

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Daily gage height, in feet, of Connecticut River at Sunderland, Mass., for 1913.

[V. Lawer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.4	7.6	10.1	19.1	9.4	11.7	3.5	4.2	1.6	2.8	5.5	3.7
2	8.4	9.7	7.8	17.6	8.5	10.2	3.8	4.2	1.8	2.7	5.1	5.0
3	8.5	7.2	6.2	15.4	8.1	9.4	4.0	3.1	2.0	2.6	5.0	5.0
4	10.0	6.8	6.0	13.8	7.3	7.8	3.8	3.2	1.35	2.6	5.2	5.0
5	10.5	7.4	6.0	13.4	7.2	6.9	2.6	4.2	1.05	2.1	5.0	4.4
6	9.5	7.2	6.0	14.0	6.8	6.8	1.9	3.7	1.8	1.4	4.4	4.2
7	8.8	7.4	6.3	13.7	6.6	6.2	2.1	3.0	1.7	3.4	4.2	3.8
8	10.4	7.1	6.6	13.0	6.4	6.4	2.2	3.2	1.5	3.2	4.0	5.8
9	10.2	10.3	5.7	11.8	5.9	4.8	2.6	3.1	2.0	3.4	3.1	7.3
10	8.6	8.2	5.2	10.6	5.8	5.2	2.6	2.6	1.6	3.0	11.4	6.2
11	7.8	8.3	8.5	10.0	5.4	5.4	2.6	2.1	1.7	2.8	8.4	5.4
12	8.8	8.1	9.8	12.5	4.0	5.2	2.6	2.6	2.0	2.0	7.8	5.7
13	8.0	8.0	8.4	9.7	5.0	5.2	2.4	2.6	1.8	1.9	7.0	5.3
14	9.2	7.9	9.5	11.6	4.7	5.0	2.4	2.2	1.6	2.8	5.4	4.3
15	8.4	7.3	16.0	11.6	5.2	3.8	2.8	3.0	1.6	3.2	5.8	4.3
16	7.8	5.8	19.3	11.0	4.8	4.1	3.3	2.4	2.3	3.4	6.1	5.2
17	8.0	5.4	17.0	10.6	4.4	5.1	3.4	2.0	2.0	3.0	4.1	5.3
18	10.5	6.9	13.8	10.4	5.4	4.8	3.8	1.6	2.2	3.0	4.4	5.1
19	12.9	7.0	11.8	10.1	4.7	4.0	3.2	2.4	1.8	2.0	4.8	5.0
20	13.0	7.0	11.2	9.8	5.5	3.6	2.3	2.2	1.8	1.9	4.2	6.3
21	12.0	6.8	13.6	10.0	5.0	3.6	2.2	1.8	1.7	3.3	4.6	5.0
22	13.2	7.2	15.7	9.9	5.0	2.8	2.7	2.2	1.5	3.4	4.8	4.2
23	11.8	7.2	17.2	9.5	5.3	3.0	2.4	2.4	3.4	5.1	5.6	4.2
24	10.8	8.7	16.0	9.1	9.8	4.0	2.6	1.8	2.6	4.9	5.6	4.3
25	11.0	8.4	15.6	8.6	11.4	3.8	3.0	1.5	4.3	5.4	5.7	3.2
26	9.8	7.2	20.0	8.6	10.5	3.5	2.9	2.2	3.2	6.5	5.1	3.2
27	8.8	6.3	26.0	10.3	10.2	3.4	2.3	2.0	2.0	7.8	4.6	4.4
28	8.0	7.0	30.4	7.3	8.6	3.2	2.4	1.9	1.5	7.9	4.6	4.6
29	7.4	.....	29.7	10.3	10.9	2.4	3.3	2.2	1.2	7.4	5.2	5.4
30	6.8	.....	25.5	10.4	13.0	1.8	3.4	2.5	2.9	6.8	3.7	5.7
31	6.5	.....	21.4	.....	12.3	.....	3.4	2.2	.....	6.2	.....	5.3

NOTE.—Daily gage height is the mean of two readings a day taken at about 7 a. m. and 6 p. m. Discharge relation Dec. 29–31 probably affected by ice.

Daily discharge, in second-feet, of Connecticut River at Sunderland, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	22,200	15,800	24,800	.....	22,200	31,100	4,590	6,050	1,740	3,330	9,240	4,990
2	18,500	23,300	16,400	56,600	18,900	25,200	5,200	6,050	1,960	3,170	8,160	7,910
3	18,900	14,400	11,200	46,800	17,500	22,200	5,620	3,850	2,200	3,020	7,910	7,910
4	24,400	13,100	10,600	39,800	14,800	16,400	5,200	4,030	1,480	3,020	8,420	7,910
5	26,400	15,100	10,600	38,100	14,400	13,500	3,020	6,050	1,180	2,320	7,910	6,490
6	22,500	14,400	10,600	40,600	13,100	13,100	2,080	4,990	1,960	1,530	6,490	6,050
7	19,900	15,100	11,600	39,400	12,500	11,200	2,320	3,670	1,850	4,400	6,050	5,200
8	26,000	14,100	12,500	36,400	11,900	11,900	2,450	4,030	1,630	4,030	5,620	10,100
9	25,200	25,600	9,760	31,500	10,400	7,420	3,020	3,850	2,200	4,400	3,850	15,000
10	19,200	17,800	8,400	26,800	10,000	8,400	3,020	3,020	1,740	3,670	30,400	11,300
11	16,400	18,200	18,900	24,400	8,920	8,920	3,020	2,320	1,850	3,330	18,800	8,960
12	19,900	17,500	23,700	34,300	5,620	8,400	3,020	3,020	2,200	2,200	16,700	9,810
13	17,100	17,100	18,500	23,300	7,900	8,400	2,720	3,020	1,960	2,080	14,000	8,690
14	21,400	16,800	22,500	30,700	7,180	7,900	2,720	2,450	1,740	3,330	8,960	6,270
15	18,500	14,800	49,400	30,700	8,400	5,200	3,330	3,670	1,740	4,030	10,100	6,270
16	16,400	10,000	.....	28,300	7,420	5,830	4,210	2,720	2,580	4,400	11,000	8,420
17	17,100	8,920	53,900	26,800	6,490	8,150	4,400	2,200	2,200	3,670	5,830	8,690
18	26,400	13,500	39,800	26,000	8,920	7,420	5,200	1,740	2,450	3,670	6,490	8,160
19	36,000	13,800	31,500	24,800	7,180	5,620	4,030	2,720	1,960	2,200	7,420	7,910
20	36,400	13,800	29,100	23,700	9,190	4,790	2,580	2,450	1,960	2,080	6,050	11,700
21	32,300	13,100	38,900	24,400	7,900	4,790	2,450	1,960	1,850	4,210	6,950	7,910
22	37,200	14,400	48,100	24,100	7,900	3,330	3,170	2,450	1,630	4,400	7,420	6,050
23	31,500	14,400	54,800	22,500	8,660	3,670	2,720	2,720	4,400	8,160	9,520	6,050
24	27,600	19,600	49,400	21,000	23,700	5,620	3,020	1,960	3,020	7,660	9,520	6,270
25	28,300	18,500	47,600	19,200	29,900	5,200	3,670	1,630	6,270	8,960	9,810	4,030
26	23,700	14,400	.....	19,200	26,400	4,590	3,500	2,450	4,030	12,300	8,160	4,030
27	19,900	11,600	.....	25,600	25,200	4,400	2,580	2,200	2,200	16,700	6,950	6,490
28	17,100	13,800	.....	14,800	19,200	4,030	2,720	2,080	1,630	17,000	6,950	6,950
29	15,100	.....	.....	25,600	28,000	2,720	4,210	2,450	1,330	15,300	8,420	.....
30	13,100	.....	.....	26,000	36,400	1,960	4,400	2,870	3,500	13,300	4,990	.....
31	12,200	.....	.....	.....	33,500	.....	4,400	2,450	.....	11,300	.....	.....

NOTE.—Discharge determined from two rating curves well defined below 60,000 second-feet. Above 60,000 second-feet the Holyoke dam introduces an unknown backwater effect and estimates of daily discharge are withheld. The mean monthly discharge for high-water months is determined from an approximate extension of the rating curve.

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Monthly discharge of Connecticut River at Sunderland, Mass., for 1913.

[Drainage area, 7,700 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	37,200	12,200	22,800	2.96	3.41	A.
February	25,600	8,920	15,500	2.01	2.09	B.
March	.....	8,400	38,700	5.03	5.80	B.
April	.....	14,800	30,500	3.96	4.42	A.
May	36,400	5,620	15,100	1.96	2.26	A.
June	31,100	1,960	9,040	1.17	1.30	A.
July	5,620	2,080	3,500	.455	.52	A.
August	6,050	1,630	3,130	.406	.47	A.
September	6,270	1,180	2,280	.296	.33	A.
October	17,000	1,530	5,910	.768	.89	A.
November	30,400	3,850	9,270	1.20	1.34	A.
December	15,000	4,050	7,530	.978	1.13	A.
The year	.....	1,180	13,600	1.77	23.96	

PASSUMPSIC RIVER NEAR ST. JOHNSBURY, VT.

Location.—At steel suspension bridge just below dam of Pierce's mills, about 5 miles above St. Johnsbury; 2 miles below Moose River, and 5 miles above Sleepers River.

Records available.—May 26, 1909, to December 31, 1913. A station was established June 29, 1903, on Passumpsic River at St. Johnsbury Center, but was discontinued November 30 of the same year because of b ackwater from the dam at St. Johnsbury.

Drainage area.—237 square miles.

Gage.—Staff, in two sections; low-water section a vertical staff bolted to ledge just above bridge; high-water section an inclined staff bolted to ledge just below bridge.

Channel and control.—Channel composed of gravel and ledge rock; slightly shifting.

Discharge measurements.—Made from downstream side of bridge, or by wading 200 feet below the bridge.

Winter flow.—Affected by ice.

Regulation.—Flow slightly affected by operation of Pierce's mills, just above station, and by other mills farther upstream.

Floods.—The maximum gage height during the flood of March, 1913, was later determined by means of a level to have been about 14.8 feet; and the maximum discharge was approximately 9,300 second-feet, or 39 second-feet per square mile.

Accuracy.—Results good.

Discharge measurements of Passumpsic River near St. Johnsbury, Vt., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 5	C. S. De Golyer	[a] 2.09	147	Sept. 10	G. H. Canfield	1.30	38.2
31	R. S. Barnes	5.33	1,650	10	.....do	1.16	65.7
Apr. 24	.....do	2.90	570				

[a] Measured under ice cover 500 feet below gage.

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Daily gage height, in feet, of Passumpsic River near St. Johnsbury, Vt., for 1913.

[Joseph Cox, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	.....	.....	6.8	2.3	2.45	1.55	1.55	1.30	1.41	1.85	1.75
2	.....	.....	.....	4.4	2.3	2.35	1.45	1.6	1.25	1.28	1.85	1.8
3	2.6	.....	.....	3.8	2.25	2.2	1.48	1.5	1.25	1.46	1.75	1.9
4	4.5	.....	.....	4.9	2.1	2.1	1.44	1.5	1.18	1.5	1.75	2.1
5	2.9	.....	.....	6.6	2.1	2.0	1.45	1.55	1.68	1.34	1.8	1.9
6	2.6	.....	.....	5.4	2.1	1.9	1.48	1.5	1.12	1.34	1.7	1.8
7	2.9	.....	.....	4.0	2.05	2.05	1.8	1.42	1.10	1.29	1.6	1.65
8	2.5	.....	.....	3.5	1.95	2.4	1.55	1.32	1.06	1.32	1.6	2.8
9	.....	.....	.....	3.3	1.9	2.1	1.45	1.35	.83	1.30	1.6	2.0
10	.....	.....	.....	3.2	1.9	1.9	1.6	1.32	1.06	1.30	1.9	2.1
11	.....	.....	.....	3.3	1.9	1.8	2.1	1.42	1.19	1.36	1.9	2.0
12	3.5	.....	.....	3.4	1.85	1.7	1.65	1.34	1.09	1.48	1.75	2.0
13	.....	.....	2.6	3.5	1.8	1.7	1.65	1.34	1.02	1.8	1.6	1.8
14	.....	.....	6.1	3.4	1.9	1.7	1.6	1.35	1.04	1.6	1.7	1.8
15	.....	.....	8.5	3.8	1.8	1.65	1.55	1.36	1.28	1.55	1.6	1.75
16	.....	.....	10.4	3.8	1.8	1.7	1.55	1.29	1.20	1.48	1.5	1.7
17	.....	.....	6.5	3.6	2.15	2.45	1.42	1.28	1.25	1.42	1.5	1.8
18	3.8	.....	5.2	3.2	1.9	2.0	1.41	1.30	1.21	1.34	1.55	1.75
19	5.7	.....	5.4	3.8	2.2	1.8	1.9	1.20	1.18	1.38	1.6	1.7
20	4.0	.....	6.8	3.6	2.1	1.7	1.65	1.22	1.10	1.74	3.2	1.6
21	5.3	.....	9.8	3.1	1.9	1.7	1.5	1.22	1.04	3.5	2.5	1.6
22	4.2	.....	11.8	3.0	2.3	1.6	1.44	1.15	1.26	2.2	2.05	1.6
23	3.3	2.45	5.0	2.9	3.5	1.55	1.36	1.22	2.3	1.8	1.9	1.75
24	3.2	.....	.....	3.0	3.4	1.5	1.44	1.20	1.6	1.7	1.9	1.6
25	3.0	.....	12.0	3.0	2.6	1.5	1.7	1.28	1.38	1.9	1.9	1.65
26	2.7	.....	.....	3.0	2.3	1.45	1.55	1.24	1.30	2.8	1.8	1.7
27	2.7	.....	12.0	2.9	2.1	2.6	1.36	1.30	1.28	2.9	1.65	.....
28	.....	.....	8.0	2.7	2.2	2.3	2.3	1.48	1.19	2.3	1.55	.....
29	.....	.....	4.6	2.6	5.0	1.75	2.5	1.38	1.25	2.15	1.7	.....
30	.....	.....	4.4	2.45	3.4	1.6	1.86	1.45	1.29	2.25	1.7	.....
31	.....	.....	5.2	.....	2.7	.....	1.69	1.25	.....	2.2	.....	.....

NOTE.—Discharge relation Jan. 1 to Mar. 28 and Dec. 27–31 affected by ice. Gage carried away by ice Mar. 22 and replaced at same datum Mar. 29. Gage heights for Mar. 22, 23, 25, 27, and 28 estimated by observer.

Daily discharge, in second-feet, of Passumpsic River near St. Johnsbury, Vt., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,480	360	405	141	141	89	111	216	189
2	1,170	360	375	120	152	80	85	216	202
3	910	340	320	126	130	80	122	189	230
4	1,410	290	290	117	130	86	130	189	290
5	2,360	290	260	120	141	171	97	202	230
6	1,660	290	230	126	130	58	97	176	202
7	1,000	275	275	202	113	55	87	152	164
8	790	245	390	141	93	49	93	152	530
9	710	230	290	120	99	22	89	164	260
10	670	230	230	152	93	49	89	230	290
11	710	230	202	290	113	69	101	230	260
12	750	216	176	164	97	54	126	189	260
13	790	202	176	164	97	44	202	152	202
14	750	230	176	152	99	47	152	176	202
15	910	202	164	141	101	85	141	152	189
16	910	202	176	141	87	71	126	130	116
17	830	305	405	113	85	80	113	130	202
18	670	230	260	111	89	73	97	141	189
19	910	320	202	230	71	68	105	152	176
20	830	290	176	164	75	55	186	670	152
21	640	230	176	130	75	47	790	420	152
22	600	320	152	117	63	82	320	275	152
23	560	790	141	101	75	360	202	230	189
24	600	750	130	117	71	152	176	230	152
25	600	460	130	176	85	105	230	230	164
26	600	360	120	141	78	89	530	202	176
27	560	290	460	101	89	85	560	164	.....
28	500	320	360	360	126	69	360	141	.....
29	460	1,460	189	420	105	80	305	176	.....
30	405	750	152	219	120	87	340	176	.....
31	.....	500	.....	174	80	.....	320	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Estimates of discharge withheld during frozen period Jan. 1 to Mar. 28. Mean discharge Dec. 27–31 estimated 152 second-feet.

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Monthly discharge of Passumpsic River near St. Johnsbury, Vt., for 1912–13.

[Drainage area, 237 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1912						
April	3,940	384	1,630	6.88	7.68	A.
May	2,500	384	793	3.35	3.86	A.
June	2,180	144	559	2.36	2.63	A.
July	203	72	113	.477	.55	B.
August	315	68	146	.616	.71	B.
September	949	122	300	1.27	1.42	A.
October	1,340	164	319	1.35	1.56	A.
November	1,820	226	449	1.89	2.11	A.
December	1,080	244	399	1.68	1.94	A.
1913						
April	2,480	495	892	3.76	4.20	A.
May	1,460	202	373	1.57	1.81	A.
June	460	120	240	1.01	1.13	A.
July	420	101	164	.692	.80	A.
August	152	63	100	.422	.49	B.
September	360	22	84.1	.355	.40	B.
October	560	85	209	.882	1.02	A.
November	670	130	208	.878	.98	A.
December	530	152	205	.865	1.00	A.

NOTE.—Table for 1912 supersedes that published in Water-Supply Paper 321, page 91, in which an incorrect value for drainage area was used.

WHITE RIVER NEAR SHARON, VT.

Location.—About 1,500 feet below the dam of the Vermont Copper Co., near Sharon, and about 800 feet above the Central Vermont Railway bridge.

Records available.—May 13, 1909, to December 31, 1913.

Drainage area.—686 square miles.

Gage.—Inclined staff reading to 10 feet, attached to a large rock on the left bank; chain gage for use at high stages nailed to trees about 80 feet upstream from the staff gage. Chain gage washed out by flood March 27, 1913.

Channel and control.—Gravel and alluvial deposits; channel divided by an island above the gages.

Discharge measurements.—Made by wading; formerly made from two suspension footbridges which connected the island with the main banks, but which have been washed out by a flood.

Regulation.—Flow affected by operation of several power plants above the station and by storage above the dam of the Vermont Copper Co. A fairly good record is kept of this storage.

Floods.—The observer's records show that the flood of March 27, 1913, reached a gage height of 13.5 feet before the chain gage was washed out and that the maximum head on the dam reached 10.25 feet at 8 p. m. March 27.

Winter flow.—Affected by ice.

Estimates of discharge withheld for additional data.

Discharge measurements of White River near Sharon, Vt., during 1913.

[Made by G. H. Canfield.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Sept. 12	2.92	151
13	1.90	4.6

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Daily gage height, in feet, of White River near Sharon, Vt., for 1913.

[C. H. Tucker, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.3	6.8			4.4			3.0				
2				5.1					2 9	2.85	3.75	4.2
3	5.2							3.0				
4				4.9		4.4			2.9	3.1		4.2
5								2.9				
6				5.3	4.1		3.1		2.6		2.9	
7						3.8				3.0		3.8
8		4.9			4.0	3.8		2.9				
9				5.0			3.0			3.0		
10												4.3
11			4.9	4.9	3.8							
12	8.2						3.3			3.1		4.0
13				5.0	4.0	3.6		2.9				
14			12.8							2.9		
15			7.9	5.0	4.0	3.4					4.1	3.9
16			6.3	4.8				2.9				
17			4.8		4.1	3.9			2.7			
18	7.1			4.6			2.9	2.9		3.0	4.1	4.1
19	7.0		4.6		4.1							
20			6.8			3.4	2.9		2.9		4.2	4.0
21	8.6			4.7				2.9		4.5		
22	6.0		6.2		4.0	3.3	2.9					4.0
23			5.0		5.5					3.0	4.1	
24	5.75			4.8	6.3			2.9	3.25			3.9
25			9.5			3.0	2.7				4.2	
26			8.9					2.9	3.1	5.2		4.0
27	5.2		13.5	4.6	4.4			2.9			4.2	
28												3.8
29				4.5		2.9						
30									2.8		4.15	
31								2.9				

MILLERS RIVER AT WENDELL, MASS.

Location.—At the hydroelectric plant of the Athol Gas & Electric Co., at Wendell. Until May, 1913, at the railroad bridge just west of the Wendell railroad station.

Records available.—Daily discharge June 4, 1909, to December 31, 1909; discharge measurements in 1911 and 1913.

Drainage area.—440 square miles.

Gage.—Two gages—one in the pond above the hydroelectric plant and the other in the tailraces, same datum. Until May, 1913, a chain gage on the railroad bridge.

Discharge measurements.—Made from the railroad bridge or by wading. Measurements for rating wheels are made from footbridge across tailrace.

Regulation.—At ordinary stages the river is under complete control by the dam of the Athol Gas & Electric Co., which was put into operation in June, 1910. Dams farther upstream, at Orange and Athol, also affect distribution of flow.

Winter flow.—Affected by ice.

Floods.—Gage readings indicate that the flood of March 26–31 reached its maximum stage on the morning of March 28 with a discharge of about 4,500 second-feet, or 10.2 second-feet per square mile of drainage area.

Accuracy.—Owing to the extent and rapidity of diurnal fluctuations incident to the operation of the power plant of the Athol Gas & Electric Co. it has been found impossible to base estimates of daily discharge on two gage readings a day. An attempt is now being made to utilize records of gate openings and ratings of discharge through the wheels at the power plant. Owing to the range and rapidity of changes in gate openings it is necessary to install recording instruments on the wheel governors. As soon as this installation is completed by the power company it is expected that accurate computations of daily discharge can be made. Automatic instruments have already been installed for securing continuous records of heights of water on the dam and in the tailrace.

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Discharge measurements of Millers River at Wendell, Mass., during 1913.

[Made by C. H. Pierce.]

Date.	Gage height.		Discharge.	Wheel gate openings.
	Pond gage.	Tail race gage.		
	Feet.	*Feet.*	*Sec.-ft.*	
Aug. 28	99.25	.....	20.0	Gates all closed.
28	99.75	.....	25.5	Do.
Sept. 21	94.32	78.16	147	0.49 opening on two wheels.
22	95.68	77.89	259	0.49 opening on four wheels.
22	96.16	77.78	204	0.67 opening on two wheels.
22	96.08	78.03	275	0.91 opening on two wheels.
22	95.92	78.36	342	0.65 opening on four wheels.

NOTE.—Gates were opened and closed between the two measurements on August 28.

DEERFIELD RIVER AT HOOSAC TUNNEL, MASS.

Location.—At wooden highway bridge near Hoosac Tunnel railroad station, about 4½ miles below Dunbar Brook, 4 miles above Pelham Brook, and 4 miles above Cold Brook.

Records available.—August 8, 1909, to November 30, 1913. A measurement was made at the bridge October 29, 1906.

Drainage area.—257 square miles.

Gage.—Chain gage fastened to downstream side of bridge.

Channel and control.—Coarse gravel and very rough; practically permanent.

Discharge measurements.—Made from upstream side of highway bridge or by wading.

Winter flow.—Affected by ice.

Regulation.—Flow seriously affected by the operation of numerous mills on the main river and its tributaries above the station, and by storage in a large reservoir at Somerset, Vt., put into use in 1913. The nearest mill is at Monroe Bridge, about 7 miles above the station.

Floods.—The highest gage height recorded by the observer during the high water of March 25–30, was 10.5 feet at 6 p. m. March 27. The corresponding discharge was approximately 16,600 second-feet, or 64.6 second-feet per square mile of drainage area.

Estimates of mean daily and monthly discharge withheld on account of large diurnal fluctuation.

Discharge measurements of Deerfield River at Hoosac Tunnel, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 15	De Golyer and Barnes.	[a] 2.40	277	Sept. 25	R. S. Barnes.....	1.98	217
Mar. 14	C. S. De Golyer.....	[b] 4.72	2,750				

[a] Partial ice cover at gage. [b] Ice going out. Measuring conditions unfavorable.

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Gage height, in feet, and discharge, in second-feet, of Deerfield River at Hoosac Tunnel, Mass., for 1913.

Day.	January.						February.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
1	8.00	3.6	1,270	4.30	3.5	1,180	8.00	4.1	1,770	4.30	3.9	1,560
2	8.00	3.3	1,020	4.30	3.25	980	8.00	3.45	1,140	4.30	3.05	820
3	8.00	3.0	780	4.30	3.2	940	8.00	3.3	1,020	4.30	3.25	980
4	8.00	3.3	1,020	4.30	3.25	980	8.00	3.8	1,460	4.30	3.5	1,180
5	8.00	3.5	1,180	4.30	3.4	1,100	8.00	3.65	1,320	4.30	3.42	1,120
6	8.00	3.4	1,100	4.30	3.3	1,020	8.00	3.5	1,180	4.30	3.4	1,100
7	8.00	3.5	1,180	4.30	4.9	2,750	8.00	3.5	1,180	4.30	3.0	780
8	8.00	4.5	2,230	4.30	4.35	2,050	8.00	3.45	1,140	4.30	3.5	1,180
9	8.00	4.1	1,770	4.30	3.65	1,320	8.00	3.3	1,020	4.30	2.78	620
10	8.00	3.5	1,180	4.30	3.35	1,060	8.00	2.35	374	4.30	2.5	450
11	8.00	3.3	1,020	4.30	3.4	1,100	8.00	2.25	330	4.30	2.2	308
12	8.00	4.0	1,660	4.30	3.82	1,480	8.00	2.3	351	4.30	2.3	351
13	8.00	3.75	1,410	4.30	3.7	1,360	8.00	2.02	241	4.30	2.0	234
14	8.00	3.35	1,060	4.30	3.2	940	8.00	2.7	.....	4.30	2.68	.....
15	8.00	3.18	924	4.30	3.25	980	8.00	2.6	.....	4.30	2.4	.....
16	8.00	3.0	780	4.30	3.15	900	8.00	2.15	.....	4.30	2.2	.....
17	8.00	3.85	1,510	4.30	4.9	2,750	8.00	2.1	.....	4.30	2.25	.....
18	8.00	5.75	4,040	4.30	5.45	3,560	8.00	2.08	.....	4.30	2.2	.....
19	8.00	5.2	3,190	4.30	4.95	2,820	8.00	2.0	.....	4.30	2.15	.....
20	8.00	4.25	1,940	4.30	4.15	1,820	8.00	2.15	.....	4.30	2.1	.....
21	8.00	5.0	2,890	4.30	4.5	2,230	8.00	2.05	.....	4.30	2.2	.....
22	8.00	4.1	1,770	4.30	4.0	1,660	8.00	2.0	.....	4.30	2.1	.....
23	8.00	3.5	1,180	4.30	4.0	1,660	8.00	3.6	.....	4.30	3.0	.....
24	8.00	4.1	1,770	4.30	3.65	1,320	8.00	2.85	.....	4.30	2.5	.....
25	8.00	3.3	1,020	4.30	3.28	1,000	8.00	2.45	.....	4.30	2.3	.....
26	8.00	3.2	940	4.30	3.05	820	7.30	1.95	.....	4.30	1.88	.....
27	8.00	3.1	860	4.30	3.0	780	7.30	2.2	.....	4.30	2.15	.....
28	8.00	2.85	668	4.30	2.6	506	7.30	2.3	.....	4.30	2.9	.....
29	8.00	2.4	398	4.30	2.25	330	.....	.....	.....	.....	.....	.....
30	8.00	2.45	324	4.30	2.32	360	.....	.....	.....	.....	.....	.....
31	8.00	2.4	398	4.30	2.2	308	.....	.....	.....	.....	.....	.....

Day.	March.						April.					
1	8.00	2.8	.....	4.30	2.78	.....	7.00	3.5	1,180	5.00	3.4	1,100
2	8.00	2.65	.....	4.30	2.6	.....	7.00	3.3	1,020	5.00	3.45	1,140
3	8.00	2.55	.....	4.30	2.5	.....	7.00	3.4	1,100	5.00	3.15	900
4	8.00	2.15	.....	4.30	2.3	.....	7.00	3.1	860	5.00	3.15	900
5	8.00	2.38	.....	4.30	2.2	.....	7.00	3.25	980	5.00	3.75	1,410
6	8.00	2.0	.....	4.30	2.1	.....	7.00	3.35	1,060	5.00	3.25	980
7	8.00	2.15	.....	4.30	2.0	.....	7.00	3.15	900	5.00	3.0	780
8	8.00	2.0	.....	4.30	1.95	.....	7.00	2.75	600	5.00	2.7	567
9	8.00	2.45	.....	4.30	3.88	1,540	7.00	2.7	567	5.00	2.3	351
10	8.00	3.6	1,270	5.00	3.45	1,140	7.00	2.1	269	5.00	2.2	308
11	8.00	2.95	742	4.30	2.8	633	7.00	2.5	450	5.00	4.3	1,990
12	8.00	2.6	506	4.30	3.0	780	7.00	5.1	3,040	5.00	4.85	2,680
13	7.30	2.95	742	5.00	2.7	567	7.00	3.35	1,060	5.00	3.25	980
14	7.30	2.85	668	5.00	6.8	6,150	7.00	4.35	2,050	5.00	3.75	1,410
15	7.00	5.95	4,400	5.00	5.1	3,040	7.00	3.1	860	5.00	3.6	1,270
16	7.00	5.65	3,880	5.00	4.6	2,350	7.00	3.45	1,140	5.00	3.25	980
17	7.00	3.7	1,360	5.00	3.5	1,180	7.00	3.3	1,020	5.00	3.0	780
18	7.00	3.8	1,460	5.00	3.2	940	7.00	2.9	704	5.00	2.85	668
19	7.00	3.0	780	5.00	3.1	860	7.00	2.7	567	5.00	2.65	536
20	7.00	3.0	780	5.00	5.8	4,130	7.00	2.75	600	5.00	2.65	536
21	7.00	4.9	2,750	5.00	5.8	4,130	7.00	2.68	555	5.00	2.65	536
22	7.00	5.05	2,960	5.00	4.9	2,750	7.00	2.55	478	5.00	2.5	.450
23	7.00	4.85	2,680	5.00	4.0	1,660	7.00	2.52	461	5.00	2.48	440
24	7.00	3.7	1,360	5.00	5.95	4,400	7.00	2.55	478	5.00	2.5	450
25	7.00	5.1	3,040	5.00	4.9	2,750	7.00	2.4	398	5.00	2.45	424
26	7.00	6.1	4,690	5.00	8.25	9,660	7.00	2.45	424	5.00	2.35	374
27	7.00	7.1	6,830	6.00	10.5	16,600	7.00	2.5	450	5.00	2.6	506
28	7.00	7.1	6,830	5.00	6.1	4,690	7.00	2.5	450	5.00	2.45	424
29	7.00	4.7	2,480	5.00	4.6	2,350	7.00	4.0	1,660	5.00	3.95	1,610
30	7.00	3.7	1,360	5.00	3.4	1,100	7.00	3.3	1,020	5.00	3.05	820
31	7.00	3.7	1,360	5.00	3.6	1,270	.....	.....	.....	.....	.....	.....

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Gage height, in feet, and discharge, in second-feet, of Deerfield River at Hoosac Tunnel, Mass., for 1913—Continued.

Day.	May.						June.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
1	7.00	2.65	536	5.00	2.5	450	7.00	3.3	1,020	5.00	3.3	1,020
2	7.00	2.4	398	5.00	2.32	360	7.00	3.1	860	5.00	3.0	740
3	7.00	2.5	450	5.00	2.48	440	7.00	3.1	860	5.00	2.9	704
4	7.00	2.35	374	5.00	2.4	398	7.00	2.5	450	5.00	2.4	398
5	7.00	2.25	330	5.30	2.35	374	7.00	2.3	351	5.00	2.1	269
6	7.00	2.2	308	5.00	2.12	277	7.00	2.15	288	5.00	1.9	202
7	7.00	2.15	288	5.00	2.1	269	7.00	1.45	94	5.00	1.4	84
8	7.00	2.3	351	5.00	2.28	342	7.00	2.3	351	5.00	2.25	330
9	7.00	2.25	330	5.00	1.8	173	7.00	2.1	269	5.00	2.45	424
10	7.00	2.15	288	5.00	1.7	147	7.00	2.0	234	5.00	1.7	147
11	7.00	2.2	308	5.00	2.35	374	7.00	2.0	234	5.00	1.55	114
12	7.00	2.7	567	5.00	2.3	351	7.00	1.8	173	5.00	1.75	160
13	7.00	2.9	704	5.00	2.0	234	7.00	1.6	124	5.00	1.6	124
14	7.00	1.9	202	5.00	2.25	330	7.00	1.5	103	5.00	1.48	99
15	7.00	1.9	202	5.00	2.0	234	7.00	1.4	84	5.00	1.35	76
16	7.00	2.3	351	5.00	2.75	600	7.00	1.4	84	5.00	1.3	67
17	7.00	2.2	308	5.00	2.35	374	7.00	1.5	103	5.00	1.6	124
18	7.00	2.1	269	5.00	2.0	234	7.00	1.5	103	5.00	1.3	67
19	7.00	2.0	234	5.00	2.1	269	7.00	1.1	39	5.00	1.55	114
20	7.00	2.3	351	5.00	2.05	254	7.00	1.0	28	5.00	1.5	103
21	7.00	2.1	269	5.00	2.6	506	7.00	2.0	234	5.00	2.05	252
22	7.00	2.6	506	5.00	2.4	398	7.00	1.95	218	5.00	1.8	173
23	7.00	3.0	780	5.00	4.0	1,660	7.00	1.6	124	5.00	1.9	202
24	7.00	4.7	2,480	5.00	4.3	1,990	7.00	1.6	124	5.00	1.6	124
25	7.00	3.7	1,360	5.00	3.6	1,270	7.00	1.55	114	5.00	1.5	103
26	7.00	3.65	1,320	5.00	3.4	1,100	7.00	1.15	46	5.00	1.35	76
27	7.00	2.65	536	5.00	2.7	567	7.00	1.4	84	5.00	1.35	76
28	7.00	2.72	580	5.00	3.1	860	7.00	1.9	202	5.00	1.2	52
29	7.00	5.3	3,340	5.00	4.2	1,880	7.00	1.25	60	5.00	1.65	136
30	7.00	4.0	1,660	5.00	3.75	1,410	7.00	1.4	84	5.00	1.65	136
31	7.00	3.5	1,180	5.00	3.45	1,140						

Day.	July.						August.					
1	7.00	1.65	136	5.00	1.25	60	7.00	2.4	398	5.00	2.45	424
2	7.00	1.6	124	5.00	1.0	28	7.00	2.38	389	5.00	2.4	398
3	7.00	1.25	60	5.00	1.1	39	7.00	2.2	308	5.00	2.6	506
4	7.00	1.15	46	5.00	1.0	28	7.00	2.45	424	5.00	2.4	398
5	7.00	1.05	34	5.00	1.0	28	7.00	2.0	234	5.00	2.7	567
6	7.00	1.2	52	5.00	1.15	46	7.00	2.65	536	5.00	2.8	633
7	7.00	1.1	39	5.00	1.0	28	7.00	2.7	567	5.00	2.7	567
8	7.00	2.1	269	5.00	1.5	103	7.00	2.2	308	5.00	2.1	269
9	7.00	1.65	136	5.00	1.5	103	7.00	1.85	188	5.00	2.0	234
10	7.00	1.5	103	5.00	1.6	124	7.00	2.7	567	5.00	2.7	567
11	7.00	1.5	103	5.00	1.35	76	7.00	2.85	668	5.00	2.9	704
12	7.00	1.8	173	5.00	2.0	234	7.00	2.85	668	5.00	3.0	780
13	7.00	1.2	52	5.00	2.0	234	7.00	2.95	742	5.00	2.7	567
14	7.00	2.0	234	5.00	2.4	398	7.00	2.3	351	5.00	2.35	374
15	7.00	2.6	506	5.00	2.4	398	7.00	2.7	567	5.00	2.35	374
16	7.00	2.0	234	5.00	1.1	39	7.00	2.0	234	5.00	1.35	76
17	7.00	1.2	52	5.00	1.4	84	7.00	1.3	67	5.00	1.28	64
18	7.00	1.2	52	5.00	1.3	67	7.00	1.35	76	5.00	2.4	398
19	7.00	1.45	94	5.00	1.3	67	7.00	1.65	136	5.00	1.35	76
20	7.00	1.2	52	5.00	1.2	52	7.00	2.3	351	5.00	2.1	269
21	7.00	2.4	398	5.00	2.0	234	7.00	2.1	269	5.00	1.3	67
22	7.00	2.8	633	5.00	2.65	536	7.00	1.3	67	5.00	1.1	39
23	7.00	2.2	308	5.00	1.55	114	7.00	1.3	67	5.00	1.1	39
24	7.00	1.8	173	5.00	1.8	173	7.00	1.2	52	5.00	1.0	28
25	7.00	1.75	160	5.00	1.8	173	7.00	1.3	67	5.00	1.25	60
26	7.00	2.1	269	5.00	2.0	234	7.00	1.3	67	5.00	1.7	147
27	7.00	1.72	152	5.00	1.75	160	7.00	1.55	114	5.00	1.05	34
28	7.00	2.0	234	5.00	2.15	288	7.00	1.0	28	5.00	1.2	52
29	7.00	2.4	398	5.00	2.1	269	7.00	1.25	60	5.00	1.3	67
30	7.00	2.8	633	5.00	2.5	450	7.00	1.05	34	5.00	1.0	28
31	7.00	2.4	398	5.00	2.45	424	7.00	1.0	28	5.00	1.2	52

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Gage height, in feet, and discharge, in second-feet, of Deerfield River at Hoosac Tunnel, Mass., for 1913—Continued.

Day.	September.						October.					
	A. M.			P. M.			A. M.			P. M.		
	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.	Time.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
1	7.00	1.2	52	5.00	1.15	46	7.00	2.15	288	5.00	1.9	202
2	7.00	1.42	88	5.00	1.65	136	7.00	2.0	234	5.00	1.7	147
3	7.00	1.6	124	5.00	1.3	67	7.00	1.95	218	5.00	2.2	308
4	7.00	1.05	34	5.00	1.1	39	7.00	1.75	160	5.00	1.8	173
5	7.00	1.0	28	5.00	1.1	39	7.00	1.7	147	5.00	1.58	120
6	7.00	1.6	124	5.00	1.3	67	7.00	1.45	94	5.00	1.5	103
7	7.00	1.35	76	5.00	1.05	34	7.00	1.5	103	5.00	1.25	60
8	7.00	1.28	64	5.00	1.55	114	7.00	1.35	76	5.00	1.5	103
9	7.00	1.3	67	5.00	1.3	67	7.00	1.18	49	5.00	1.5	103
10	7.00	1.45	94	5.00	1.65	136	7.00	1.55	114	5.00	1.6	124
11	7.00	1.45	94	5.00	1.5	103	7.00	1.6	124	5.00	1.5	103
12	7.00	1.2	52	5.00	1.1	39	7.00	1.3	67	5.00	1.35	76
13	7.00	1.05	34	5.00	1.0	28	7.00	2.18	300	5.00	2.1	269
14	7.00	1.0	28	5.00	1.05	34	7.00	2.0	234	5.00	1.65	136
15	7.00	1.15	46	5.00	1.1	39	7.00	1.55	114	5.00	1.5	103
16	7.00	1.05	34	5.00	1.0	28	7.00	1.58	120	5.00	1.5	103
17	7.00	1.1	39	5.00	1.3	67	7.00	1.68	142	5.00	1.55	114
18	7.00	1.1	39	5.00	1.05	34	7.00	1.45	94	5.00	1.4	84
19	7.00	1.7	147	5.00	1.55	114	7.00	1.3	67	5.00	1.3	67
20	7.00	1.3	67	5.00	1.1	39	7.00	1.8	173	5.00	3.8	1,460
21	7.00	1.0	28	5.00	2.0	234	7.00	3.6	1,270	5.00	3.1	860
22	7.00	2.15	288	5.00	4.1	1,770	7.00	2.5	450	5.00	2.5	450
23	7.00	3.7	1,360	5.00	3.0	780	7.00	2.1	269	5.00	2.0	234
24	7.00	3.0	780	5.00	2.2	308	7.00	1.5	103	5.00	1.7	147
25	7.00	2.15	288	5.00	1.75	160	7.00	1.7	147	5.00	1.9	202
26	7.00	2.0	234	5.00	1.7	147	7.00	4.0	1,660	5.00	5.3	3,340
27	7.00	1.55	114	5.00	1.6	124	7.00	4.9	2,750	5.00	3.5	1,180
28	7.00	1.48	99	5.00	1.3	67	7.00	3.2	940	5.00	3.0	780
29	7.00	1.25	60	5.00	1.2	52	7.00	2.95	742	5.00	3.2	940
30	7.00	1.15	46	5.00	1.18	49	7.00	3.5	1,180	5.00	3.0	780
31							7.00	2.3	351	5.00	2.25	330

Day.	November.						December.					
1	7.00	2.2	308	5.00	2.2	308						
2	7.00	1.75	160	5.00	1.6	124						
3	7.00	1.6	124	5.00	1.88	196						
4	7.00	2.25	330	5.00	2.2	308						
5	7.00	2.3	351	5.00	2.4	398						
6	7.00	2.3	351	5.00	2.2	308						
7	7.00	2.15	288	5.00	1.9	202						
8	7.00	1.95	218	5.00	1.9	202						
9	7.00	3.0	780	4.00	6.7	5,930						
10	7.00	6.7	5,930	5.00	5.3	3,340						
11	7.00	4.1	1,770	5.00	3.7	1,360						
12	7.00	3.2	940	5.00	3.1	860						
13	7.00	2.9	704	5.00	2.5	450						
14	7.00	2.68	555	5.00	3.0	780						
15	7.00	2.85	668	5.00	2.48	440						
16	7.00	2.55	478	5.00	2.4	398						
17	7.00	2.4	396	5.00	2.2	308						
18	7.00	2.45	424	5.00	2.4	398						
19	7.00	2.3	351	5.00	2.2	308						
20	7.00	3.0	780	5.00	2.9	704						
21	7.00	3.3	1,020	5.00	3.0	780						
22	7.00	2.8	633	5.00	2.8	633						
23	7.00	2.7	567	5.00	2.65	536						
24	7.00	2.5	450	4.30	2.4	398						
25	7.00	2.25	330	4.30	2.48	440						
26	7.00	2.25	330	4.30	2.3	351						
27	7.00	2.15	288	4.30	2.0	234						
28	7.00	2.1	269	4.30	2.0	234						
29	7.00	2.1	269	4.30	2.15	288						
30	7.30	2.2	308	4.30	2.15	288						
31												

NOTE.—Discharge relation probably affected by ice Feb. 14 to Mar. 9.

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DEERFIELD RIVER AT CHARLEMONT, MASS.

Location.—One mile below the village of Charlemont.

Records available.—June 19 to December 31, 1913.

Drainage area.—362 square miles.

Gage.—Automatic recording gage on left bank, referenced to a hook gage in the well.

Channel and control.—Channel covered with coarse gravel and bowlders; fairly uniform section.

Discharge measurements.—Made from cable or by wading.

Regulation.—Flow regulated by a storage reservoir at Somerset, Vt., and affected by the operation of several mills above the station. Results corrected for storage at Somerset, from data furnished by the company operating the reservoir.

Winter flow.—Affected by ice.

Floods.—The high water of March 25–30, 1913, reached a maximum stage of 13.6 feet gage height, as determined by engineers of the Geological Survey from high-water marks. The corresponding discharge was approximately 29,000 second-feet, or 80 second-feet per square mile.

Accuracy.—Results good.

Discharge measurements of Deerfield River at Charlemont, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
June 20	R. S. Barnes	1.98	188	Aug. 14	C. H. Pierce	2.29	363
23	do	1.84	138	Oct. 28	C. S. De Golyer	3.58	1,460
26	do	1.74	105	28	do	3.39	1,230
26	do	1.60	77	29	do	2.98	827
Aug. 13	C. H. Pierce	2.37	414				

Daily gage height, in feet, of Deerfield River at Charlemont, Mass., for 1913.

[Arthur Rhodes and Albert Anthony, observers.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.74	2.20	1.49	1.79	2.40	2.46
2	.....	1.64	2.10	1.62	2.17	2.27	2.42
3	.....	1.48	1.86	1.71	2.08	2.34	2.54
4	.....	1.62	1.74	1.49	2.06	2.22	2.86
5	.....	1.50	2.06	1.63	1.95	2.36	2.60
6	.....	.....	2.42	1.76	1.78	2.25	2.66
7	.....	1.52	2.62	1.80	1.77	2.18	2.96
8	.....	2.18	2.36	1.54	1.59	2.20	4.65
9	.....	1.68	1.96	1.71	1.77	8.0	3.48
10	.....	1.88	2.19	1.47	1.88	6.35	3.08
11	.....	1.88	2.76	1.67	1.78	3.6	2.92
12	.....	1.75	2.66	1.57	1.80	3.38	2.67
13	.....	.....	2.45	1.46	2.06	3.04	2.66
14	.....	2.18	2.26	1.46	2.11	2.89	2.66
15	.....	2.23	2.01	1.43	1.95	2.91	2.70
16	.....	2.10	1.77	1.48	1.82	2.78	2.54
17	.....	1.53	1.51	1.52	1.84	2.65	2.56
18	.....	1.60	1.83	1.50	1.80	2.59	2.52
19	1.60	1.61	2.16	1.72	1.78	2.57	2.47
20	1.97	1.59	1.86	1.63	2.18	3.36	2.23
21	2.10	2.06	1.70	1.54	3.35	3.35	2.33
22	2.08	2.02	1.49	2.78	2.58	2.91	2.41
23	1.86	1.96	1.55	3.65	2.30	2.72	2.37
24	1.81	1.96	1.62	2.53	2.15	2.63	2.29
25	1.82	2.04	1.43	2.11	2.96	2.56	2.34
26	1.68	2.02	1.48	1.93	4.9	2.47	2.32
27	1.74	1.91	1.71	1.81	4.9	2.40	2.22
28	1.82	2.00	1.46	1.67	3.5	2.34	2.36
29	1.64	2.38	1.58	1.66	2.92	2.30	3.6
30	1.72	2.29	1.73	1.62	2.70	2.35	3.9
31	.....	2.27	1.50	.....	2.53	.....	3.75

NOTE.—Gage heights for periods June 19 to July 16, Aug. 5–13; Oct. 13–22, and Nov. 3–13 determined from two readings a day on staff gage. For all other periods gage heights computed from records obtained by a Gurley electric water-stage register. Discharge relation Dec. 29–31 affected by ice.

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Daily discharge, in second-feet, of Deerfield River at Charlemont, Mass., for 1913.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	106	310	49	121	435	435
2	.....	81	255	76	294	352	448
3	.....	47	147	97	245	396	528
4	.....	76	106	49	235	322	760
5	.....	51	235	79	184	409	633
6	.....	53	448	112	118	340	612
7	.....	55	584	124	115	299	854
8	.....	299	409	59	70	310	2,960
9	.....	90	188	97	115	1,000	1,340
10	.....	154	305	45	154	6,520	942
11	.....	154	685	87	118	1,470	806
12	.....	109	612	66	124	1,220	619
13	.....	204	468	43	235	906	626
14	.....	299	346	43	260	782	612
15	.....	328	210	38	184	798	640
16	.....	255	115	47	132	700	528
17	.....	57	53	55	139	606	535
18	.....	72	135	51	124	563	514
19	72	74	288	100	118	549	416
20	192	70	147	79	299	1,210	322
21	255	235	94	59	1,200	1,200	390
22	245	215	49	700	556	798	442
23	153	188	62	1,530	370	655	416
24	128	188	76	521	282	591	364
25	132	225	38	260	838	542	396
26	90	215	47	175	3,390	480	383
27	106	166	97	128	3,390	435	322
28	132	205	43	87	1,360	396	346
29	81	422	68	85	806	370	326
30	100	364	103	76	640	402	297
31	.....	352	51	.....	521	.....	297

NOTE.—Discharge determined from a well-defined rating curve, based on high-water measurements made in March, 1914. Discharge interpolated for days when no gage height was reported, and estimated Dec. 29–31.

Monthly discharge of Deerfield River at Charlemont, Mass., for 1913.

[Drainage area, 362 square miles.]

	Discharge in second-feet.			Run-off (total in acre-feet).			Discharge without storage, second-feet.		Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Observed.	Stored at Somerset, Vt.	Without storage.	Mean.	Per square mile.		
June	[a] 255	[a] 81	[a] 140	.....	− 476	.....	.....	.....	.....	
July	422	47	175	10,800	−4,490	6,310	103	0.285	0.33	A.
August	685	38	219	13,500	−8,610	4,890	79.5	.220	.25	A.
September	1,530	38	107	9,940	+ 309	10,250	172	.475	.53	A.
October	3,390	70	540	33,200	+2,840	36,000	585	1.62	1.87	A.
November	11,000	299	1,170	69,600	+7,080	76,700	1,290	3.56	3.97	A.
December	2,960	[b] 297	616	37,900	+2,560	40,500	659	1.82	2.10	A.

[a] For June 19–30. [b] Estimated by means of back water curve.

NOTE.—The increase (+) or decrease (−) of water held in storage at Somerset, Vt., during the month has been computed by engineers of the Geological Survey from data of storage increase or decrease furnished by the company operating the reservoir.

DEERFIELD RIVER AT SHELBURNE FALLS, MASS.

Location.—At the plant of the Greenfield Electric Light & Power Co., at Shelburne Falls.

Records available.—June 1, 1907, to December 31, 1913.

Drainage area.—501 square miles.

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Computations of discharge.—The flow through the wheels is computed from the gate openings and from power readings made at half-hour intervals. The height of water on the dam, in the fore bay, in the tailrace, and at the wasteways is read three times daily. The total electrical output is also measured twice a day. For description of dam and plant see Water-Supply Paper 321, page 99.

Accuracy.—Results good.

Cooperation.—Results furnished by H. K. Barrows, consulting engineer, Boston, Mass.

Daily discharge, in second-feet, of Deerfield River at Shelburne Falls, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,890	2,710	1,180	3,470	889	1,120	122	286	58	158	389	557
2	1,360	1,490	799	1,870	863	1,050	120	273	96	373	350	311
3	2,490	1,450	641	1,500	612	930	142	101	96	278	418	473
4	3,360	1,440	763	1,480	451	785	67	244	97	480	394	1,040
5	2,000	1,200	570	1,870	658	345	56	286	123	152	442	1,040
6	1,530	1,320	495	1,800	545	360	61	393	154	210	471	740
7	3,380	1,030	463	1,500	389	315	113	492	58	185	374	1,200
8	4,290	1,210	339	1,330	467	256	240	582	135	63	381	1,770
9	2,890	1,240	395	1,330	357	444	114	215	117	55	6,030	1,380
10	2,110	1,040	1,500	1,020	369	349	145	303	160	253	5,480	1,040
11	1,550	557	1,340	2,300	253	284	171	565	159	172	2,170	1,040
12	4,150	4,098	1,020	4,600	345	254	148	700	(110)	203	1,280	740
13	2,750	381	1,330	3,130	335	280	142	462	(150)	258	1,280	880
14	1,730	471	5,470	2,980	332	194	327	348	(100)	250	1,280	605
15	1,440	397	7,110	2,070	311	117	270	331	114	252	727	605
16	1,370	376	4,810	1,680	326	250	242	174	70	251	824	740
17	3,290	689	2,080	1,500	344	258	128	28	82	148	873	740
18	5,730	413	1,330	1,330	305	206	100	104	58	184	568	740
19	4,800	357	1,170	1,130	380	180	69	316	57	17	579	669
20	2,700	329	2,980	963	403	240	121	184	149	655	1,270	342
21	3,820	465	3,720	1,020	355	244	230	100	0	1,400	1,280	334
22	2,920	879	4,890	1,030	390	224	261	127	892	832	874	550
23	2,110	1,020	1,790	889	1,710	227	220	108	1,600	495	696	672
24	2,710	789	3,220	755	2,700	212	228	42	733	520	715	377
25	1,920	600	4,280	756	1,620	171	198	124	188	1,560	670	349
26	1,450	469	12,080	749	1,190	164	176	78	302	4,580	567	496
27	1,530	480	19,180	661	903	144	185	98	123	2,930	409	429
28	923	1,230	7,460	755	1,510	162	232	55	74	1,730	481	150
29	1,060	.....	3,480	1,870	3,570	112	294	165	181	1,050	536	387
30	1,073	.....	2,020	1,490	2,030	150	410	124	139	598	432	333
31	1,071	.....	2,740	.....	1,370	.....	277	157	.....	609	.....	346

Monthly discharge of Deerfield River at Shelburne Falls, Mass., for 1913.

[Drainage areas, 501 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	5,730	923	2,430	4.86	5.60
February	2,710	329	876	1.75	1.82
March	19,180	339	3,240	6.48	7.47
April	4,600	661	1,630	3.25	3.63
May	3,570	253	849	1.70	1.96
June	1,120	112	334	.67	.75
July	410	56	181	.36	.42
August	700	28	244	.49	.56
September	1,600	0	212	.42	.47
October	4,580	17	674	1.35	1.56
November	6,030	350	1,070	2.14	2.39
December	1,770	150	679	1.35	1.56
The year	19,180	0	1,040	2.08	28.19

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WARE RIVER AT GIBBS CROSSING, MASS.

Location.—Between the highway bridge and the electric railway bridge about 3 miles below Ware, at the point known as Gibbs Crossing. Muddy Brook, with a drainage area of about 30 square miles, enters from the right at Ware. Beaver Brook, with a drainage area of about 29 square miles, enters from the right about 2½ miles below the station.

Records available.—August 20, 1912, to December 31, 1913.

Drainage area.—201 square miles.

Gage.—Barrett & Lawrence automatic gage on the right bank just above the highway bridge, referenced to a hook gage in the well.

Channel and control.—Channel rough, but practically permanent. A large amount of aquatic vegetation in the channel during the summer months, but none at the control.

Discharge measurements.—Made from the downstream side of the highway bridge at extreme high stages, from the upstream side of the electric railway bridge at medium stages, and by wading at low stages. Measurements made at the electric railway bridge are corrected for angle of current.

Regulation.—Flow affected by the operation of mills, which at low stages cause a large variation in discharge during days when the mills are in operation, and a low discharge on Sundays and holidays.

Winter flow.—Somewhat affected by ice.

Floods.—The high water of March 26 to 31, 1913, reached a maximum stage of 5.54 feet gage height at 9.30 a. m. March 28, as determined from readings of hook gage made by engineers of the Geological Survey on that date. The corresponding discharge was 2,640 second-feet, or 13.1 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Ware River at Gibbs Crossing, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 4	R. S. Barnes	3.24	645	Mar. 29	O. W. Hartwell	4.31	1,670
9	C. S. De Golyer	3.00	485	Aug. 11	C. H. Pierce	2.19	136
Feb. 11	De Golyer and Barnes	[a] 3.15	409	12	do	1.49	15.3
Mar. 12	De Golyer and Mathers	3.07	507	Sept. 7	do	1.49	24.9
28	O. W. Hartwell	5.51	2,600	7	do	1.49	22.3
28	do	5.48	2,430				

[a] Anchor ice on control.

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Daily discharge, in second-feet, of Ware River at Gibbs Crossing, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	690	300	672	1,340	380	325	97	81	68	70	182	.....
2	439	270	571	1,160	337	326	138	46	112	74	178	.....
3	406	295	460	935	292	278	116	24	125	62	173	.....
4	468	280	358	768	238	226	24	74	136	59	213	.....
5	373	.....	303	776	292	215	21	90	112	15	178	.....
6	346	.....	303	730	300	188	19	62	72	84	160	.....
7	292	.....	207	693	289	147	88	68	29	76	153	174
8	381	.....	218	629	226	129	96	88	114	76	84	530
9	471	.....	214	553	236	214	112	63	109	73	134	537
10	345	.....	360	503	162	200	86	19	89	46	310	350
11	300	.....	449	412	160	194	82	68	58	42	348	325
12	333	.....	518	1,400	219	119	52	79	42	36	283	283
13	489	.....	489	1,520	248	93	20	56	37	97	249	242
14	388	.....	568	.....	187	90	79	56	17	90	224	202
15	326	.....	1,260	.....	189	40	90	51	51	86	180	267
16	303	.....	1,300	.....	186	166	99	51	72	123	186	264
17	338	.....	1,050	.....	136	133	93	23	42	113	200	209
18	429	.....	785	.....	133	128	53	103	46	50	216	176
19	407	.....	642	.....	209	112	38	76	64	43	221	196
20	408	.....	615	605	239	115	20	46	58	145	194	134
21	375	.....	744	575	164	106	52	49	21	171	211	131
22	370	.....	752	498	171	34	67	48	99	156	140	177
23	326	.....	613	498	204	152	59	44	118	85	135	236
24	363	.....	619	461	636	144	71	17	121	88	197	192
25	358	.....	653	412	705	130	63	31	128	168	234	261
26	283	.....	954	372	569	103	56	42	110	749	200	333
27	328	170	1,700	320	404	96	15	46	74	676	88	315
28	275	310	2,370	386	365	76	54	42	23	571	181	226
29	273	.....	1,930	422	551	25	61	68	59	430	110	262
30	262	.....	1,540	446	613	106	77	128	41	328	190	299
31	238	.....	1,330	.....	468	.....	60	130	.....	267	.....	217

NOTE.—Discharge determined from a well-defined rating curve by averaging the discharge for six 4-hour periods each day. Discharge relation affected by ice Feb. 5–26. Mean discharge estimated as follows: For February, 193 second-feet, from discharge measurement of Feb. 11 and study of climatological data; Apr. 14–19, 1,170 second-feet, and Dec. 1–6, 163 second-feet, by comparison with records on adjacent streams.

Monthly discharge of Ware River at Gibbs Crossing, Mass., for 1913.

[Drainage area, 201 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	690	238	367	1.83	2.11	A.
February	.....	.....	193	.960	1.00	C.
March	2,370	207	792	3.94	4.54	A.
April	1,520	320	780	3.88	4.33	A.
May	705	133	307	1.53	1.76	A.
June	326	25	147	.731	.82	A.
July	138	15	66.4	.330	.38	A.
August	130	17	60.3	.300	.35	A.
September	136	17	74.9	.373	.42	A.
October	749	15	166	.826	.95	A.
November	348	84	192	.955	1.07	A.
December	.....	.....	244	1.21	1.40	B.
The year	2,370	15	283	1.41	19.16	

SWIFT RIVER AT WEST WARE, MASS.

Location.—Just below the wooden dam opposite West Ware station of the Athol branch of the Boston & Albany Railroad, about 6 miles downstream from Enfield.

Records available.—July 15, 1910, to December 31, 1913.

Drainage area.—191 square miles.

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Gage.—A Barrett-Lawrence automatic gage referred to a hook gage in the well. Prior to August 25, 1912, a chain gage on a footbridge 400 feet below the dam.

Channel and control.—Gravel and alluvial deposits; some aquatic vegetation in channel during summer months.

Discharge measurements.—Made from a cable about 50 feet above the gage, or by wading.

Regulation.—Flow affected by operation of power plants at Enfield which at low stages cause a large variation in discharge during days when the mills are in operation, and a low discharge on Sundays and holidays.

Winter flow.—Seldom affected by ice.

Floods.—The high water of March 26 to 31, 1913, reached a maximum stage of 8.43 feet gage height about 10 a. m. March 29, as shown by the automatic gage records. The corresponding discharge was approximately 1,900 second-feet, or 10 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Swift River at West Ware, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 8	C. S. De Golyer	3.46	420	Mar. 12	C. S. De Golyer	3.66	465
8	do	3.44	394	27	O. W. Hartwell	5.53	987
Feb. 12	do	2.58	191	27	do	5.62	1,010
Mar. 12	J. G. Mathers	3.66	465	Aug. 11	C. H. Pierce	1.47	33.8

Daily discharge, in second-feet, of Swift River at West Ware, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	459	.....	477	990	389	512	86	.....	66	.....	176	156
2	440	278	503	913	357	406	84	.....	74	.....	150	164
3	417	256	484	799	330	342	81	.....	76	.....	127	168
4	435	268	435	698	305	291	.....	.....	63	.....	116	164
5	411	237	379	651	269	263	.....	.....	76	.....	109	154
6	359	239	321	642	267	228	60	.....	72	.....	102	144
7	323	229	300	607	295	197	80	.....	50	.....	100	150
8	373	214	301	572	252	182	74	49	84	.....	88	255
9	456	183	271	529	232	158	66	40	73	76	117	328
10	409	165	295	487	218	155	60	31	69	52	152	325
11	407	176	384	508	207	152	59	43	62	52	176	287
12	401	160	440	800	181	149	50	43	59	25	186	240
13	422	184	452	1,040	186	137	43	40	50	47	172	209
14	408	162	516	1,090	185	126	60	38	34	62	156	193
15	368	153	656	1,010	181	104	62	38	62	64	146	172
16	330	142	863	875	199	122	52	38	61	58	140	164
17	318	138	888	756	199	107	55	29	56	51	133	168
18	309	119	765	643	172	104	57	41	56	41	131	160
19	414	.....	634	572	160	97	47	42	54	23	136	152
20	422	143	554	520	161	107	35	49	49	82	134	131
21	417	150	579	475	159	102	55	42	34	119	138	129
22	395	190	634	454	172	82	59	40	61	114	136	133
23	371	284	626	425	.....	105	55	41	72	111	122	127
24	372	309	591	398	.....	103	.....	24	63	112	133	188
25	377	315	599	394	588	104	.....	46	53	193	117	260
26	346	273	700	361	580	97	.....	42	50	328	109	300
27	332	239	1,020	323	496	95	.....	32	51	431	93	292
28	311	.....	1,660	325	416	80	.....	37	28	436	97	235
29	279	.....	1,820	399	.....	65	.....	44	43	365	124	223
30	258	.....	1,470	396	.....	97	.....	79	.....	285	142	186
31	241	.....	1,150	.....	.....	.....	.....	51	.....	218	.....	174

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge for months when there were lapses in the automatic gage records, estimated by comparison with records on adjacent streams.

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Monthly discharge of Swift River at West Ware, Mass., for 1913.

[Drainage area, 191 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	459	241	375	1.96	2.26	A.
February	358	119	213	1.12	1.17	A.
March	1,820	271	670	3.51	4.05	A.
April	1,090	323	622	3.26	3.64	A.
May	645	159	305	1.60	1.84	A.
June	512	65	162	.848	.95	A.
July	.....	.....	58.1	.304	.35	B.
August	.....	.....	42.3	.221	.25	B.
September	84	28	57.7	.302	.34	A.
October	.....	.....	125	.654	.75	B.
November	186	88	131	.686	.76	A.
December	328	127	198	1.04	1.20	A.
The year	1,820	.....	247	1.29	17.56	

QUABOAG RIVER AT WEST BRIMFIELD, MASS.

Location.—At the two-span highway bridge near the West Brimfield station of the Boston & Albany Railroad.

Records available.—August 23, 1909, to December 31, 1913.

Drainage area.—150 square miles.

Gage.—Barrett & Lawrence automatic gage at downstream end of center pier of bridge, referred to a lock gage in the well. Prior to August 19, 1912, a vertical staff on the upstream side of the right abutment of the bridge at same datum as present gage.

Channel and control.—Stream bed covered with bowlders, gravel, and alluvial deposits.

Discharge measurements.—Made from the highway bridge or by wading near the bridge.

Regulation.—Flow affected by the operation of power plants at West Warren, 3 miles above the station, which at low stages causes a large variation in discharge during days when the mills are in operation, and a low discharge on Sundays and holidays.

Floods.—Owing to the large amount of storage above the station, the heavy precipitation of March, 1913, did not produce a flood stage. The maximum stage during the year occurred on April 16, with a discharge of about 1,200 second-feet, or 8 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Quaboag River at West Brimfield, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 9	C. S. De Golyer	2.88	327	Mar. 28	O. W. Hartwell	3.73	847
Feb. 13	R. S. Barnes	a 3.43	183	Aug. 9	C. H. Pierce	1.64	15.9

a Discharge relation affected by ice.

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Daily discharge, in second-feet, of Quaboag River at West Brimfield, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	274	270	414	855	412	330	56	50	37	48	166	135
2	250	230	415	729	389	307	56	32	69	62	158	131
3	279	300	291	779	359	272	58	28	52	68	161	122
4	251	280	352	732	342	253	24	62	48	36	159	119
5	233	220	334	704	309	223	31	39	43	41	132	120
6	263	.....	311	664	290	196	37	41	40	72	130	120
7	226	.....	209	603	241	179	68	44	31	53	131	142
8	336	.....	275	558	226	180	59	34	68	59	116	210
9	250	.....	301	523	206	173	47	29	53	52	161	188
10	316	.....	288	501	174	152	59	26	43	51	260	223
11	291	.....	334	529	154	145	61	49	43	34	199	214
12	322	.....	347	737	158	131	39	40	41	49	177	179
13	299	.....	317	783	150	132	40	34	29	69	130	.....
14	354	.....	407	623	148	110	77	36	24	54	148	.....
15	337	.....	465	823	144	99	55	35	55	45	141	.....
16	279	.....	468	962	138	111	61	23	38	34	134	218
17	270	.....	431	1,010	146	91	57	17	39	40	144	202
18	281	.....	429	941	140	85	60	51	38	43	133	202
19	265	.....	414	856	143	80	41	52	45	33	131	171
20	281	.....	438	756	120	85	35	46	30	81	145	189
21	281	.....	451	741	116	77	71	44	33	74	146	170
22	271	.....	411	704	138	79	50	44	76	72	139	173
23	268	.....	419	651	199	105	61	46	64	66	135	170
24	285	.....	416	599	364	74	59	11	60	67	135	233
25	284	.....	413	544	333	64	56	49	59	150	114	227
26	251	.....	515	502	310	71	41	37	53	45	105	249
27	274	325	782	471	296	61	28	34	38	265	104	212
28	248	375	853	467	302	45	62	.....	48	234	90	241
29	234	.....	904	470	393	52	59	.....	71	219	124	285
30	249	.....	910	450	366	82	59	.....	50	215	135	290
31	241	.....	920	.....	347	.....	53	.....	.....	192	.....	266

NOTE.—Discharge determined from a well-defined rating curve by averaging the discharge for six 4-hour periods each day. Discharge relation affected by ice Feb. 6–26. Mean discharge for this period estimated 143 second-feet from discharge measurement of Feb. 13 and climatological data. Mean discharge Aug. 28–31 estimated 52 second-feet and Dec. 13–15, 173 second-feet, by comparison with records on adjacent streams.

Monthly discharge of Quaboag River at West Brimfield, Mass., for 1913.

[Drainage area, 150 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	354	226	276	1.84	2.12	A.
February	375	.....	179	1.19	1.24	C.
March	920	209	459	3.06	3.53	A.
April	1,010	450	682	4.55	5.08	A.
May	412	116	244	1.63	1.88	A.
June	330	45	135	.900	1.00	A.
July	77	24	52.3	.349	.40	A.
August	.....	11	40.0	.267	.31	A.
September	76	24	47.3	.315	.35	A.
October	265	33	90.8	.605	.70	A.
November	260	90	143	.953	1.06	A.
December	.....	.....	191	1.27	1.46	A.
The year	1,010	11	211	1.41	19.13	

WESTFIELD RIVER AT KNIGHTVILLE, MASS.

Location.—At the single-span steel highway bridge known locally as the Pitcher Bridge, at Knightville, 1 mile north of the outlet of Norwich Lake and about 3 miles above the confluence with the middle branch of Westfield River.

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Records available.—August 26, 1909, to December 31, 1913.
Drainage area.—162 square miles.
Gage.—Chain attached to downstream side of highway bridge.
Discharge measurements.—Made from highway bridge or by wading.
Control.—Channel rough, covered with bowlders and ledge rock; not likely to change.
Regulation.—Flow not seriously affected by regulation.
Winter flow.—Affected by ice.
Floods.—The high water of March 25–30, 1913, reached its maximum stage during the night of March 27 as indicated by the records of the gage observer. Determinations made from high-water marks by engineers of the Geological Survey show that the crest elevation was about 8.9 feet gage height, with a corresponding discharge of approximately 5,100 second-feet, or 31.5 second-feet per square mile of drainage area.
Accuracy.—Results fair.

Discharge measurements of Westfield River at Knightville, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 14	C. S. De Golyer	a 2.30	137
Aug. 8	C. H. Pierce	.84	17.3

a Partial ice cover.

Daily gage height, in feet, of Westfield River at Knightville, Mass., for 1913.

[Clement Burr, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.2	3.1	3.6	2.2	1.92	0.96	0.88	0.86	1.02	1.84	2.1
2	3.6	2.1	2.7	3.0	2.0	1.90	.95	.82	.88	1.27	1.81	2.25
3	3.3	2.15	2.35	2.75	1.96	1.76	.90	.81	.84	1.52	1.75	2.4
4	3.7	2.15	2.15	2.7	1.94	1.76	.90	.84	.81	1.46	1.71	2.55
5	2.6	2.0	2.1	3.8	1.90	1.73	.92	.87	.92	1.36	1.68	2.45
6	2.3	1.95	2.0	3.2	1.86	1.54	.88	.84	1.32	1.22	1.68	2.25
7	2.9	1.89	1.98	2.85	1.84	1.57	.82	.78	1.22	1.10	1.66	2.4
8	4.2	1.95	1.88	2.6	1.74	1.53	.84	.67	1.10	1.11	1.68	2.2
9	3.3	1.99	2.5	2.55	1.70	1.45	.88	.70	.94	1.10	4.4	2.7
10	2.65	1.89	2.8	2.4	1.68	1.47	.89	.60	.87	1.12	4.6	2.4
11	2.75	1.83	2.5	2.6	1.62	1.48	.80	.68	.85	1.11	3.3	2.35
12	4.2	2.05	2.45	4.8	1.60	1.42	.79	.74	.80	1.40	2.7	2.25
13	3.0	2.1	2.7	4.0	1.57	1.40	.94	.84	.76	1.66	2.5	2.1
14	2.6	2.25	4.1	3.8	1.56	1.35	.94	.81	.76	1.48	2.45	2.3
15	2.5	2.05	4.9	3.4	1.57	1.26	.90	.92	.74	1.37	2.3	2.35
16	2.45	1.98	3.7	3.0	1.74	1.20	.89	.98	.74	1.23	2.3	2.2
17	3.4	1.96	2.9	2.8	1.90	1.20	.85	.86	.72	1.20	2.25	2.15
18	3.8	1.92	2.75	2.6	1.72	1.12	.83	.82	.78	1.11	2.2	2.1
19	3.4	2.15	2.55	2.6	1.66	1.12	.90	.78	.83	1.06	2.2	1.98
20	2.65	1.88	3.7	2.45	1.60	1.30	.86	.79	.85	1.40	2.8	1.90
21	3.4	.....	3.5	2.35	1.52	1.50	.89	.80	.96	2.2	2.5	2.0
22	2.75	.....	3.2	2.4	1.56	1.38	.87	.84	2.25	1.56	2.3	2.0
23	2.5	.....	2.9	2.35	2.1	1.30	.84	.84	2.3	1.38	2.2	1.90
24	2.75	.....	3.0	2.2	3.7	1.22	.83	.83	1.64	1.38	2.1	2.2
25	2.45	1.92	3.1	2.2	2.65	1.14	.83	.80	1.44	2.3	2.1	2.25
26	2.3	1.90	4.9	2.15	2.2	1.14	.80	.78	1.31	4.0	2.05	2.2
27	2.35	1.84	6.9	2.1	2.0	1.15	.90	.79	1.12	4.0	2.05	1.96
28	2.25	3.4	5.0	2.25	2.2	1.14	.97	.80	1.02	2.75	2.05	1.8
29	2.1	.....	3.9	2.75	3.6	1.08	1.21	.92	.98	2.4	2.35	1.85
30	2.25	.....	3.3	2.45	2.6	.96	1.16	1.16	.94	2.2	2.3	1.89
31	2.2	.....	4.2	.....	2.2	.....	1.04	1.06	.....	2.0	.....	1.92

NOTE.—Daily gage height is the mean of two readings made at about 7 a. m. and 5 p. m. Discharge relation affected by ice Feb. 8–27, and Dec. 29–31.

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Daily discharge, in second-feet, of Westfield River at Knightville, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	735	795	735	1,050	280	186	25	19	17	30	164	280
2	1,050	245	510	675	210	180	24	14	19	56	156	342
3	855	262	342	538	198	143	20	14	16	94	141	365
4	1,120	262	262	510	192	143	20	16	14	84	131	435
5	460	210	245	1,180	180	136	22	18	22	68	125	388
6	320	195	210	795	169	97	19	16	63	50	125	300
7	620	177	204	592	164	103	14	12	50	37	121	920
8	1,440	.....	175	460	139	95	16	7	37	38	125	795
9	855	.....	410	435	129	82	19	8	23	37	1,570	510
10	485	.....	565	365	125	85	19	4	18	39	1,710	365
11	538	.....	410	460	112	87	13	7	16	38	855	342
12	1,440	.....	388	1,850	108	77	12	10	13	74	510	300
13	675	.....	510	1,310	103	74	23	16	11	121	410	280
14	460	.....	1,380	1,180	101	67	23	14	11	87	388	320
15	410	.....	1,920	920	103	55	20	22	10	70	320	342
16	388	.....	1,120	675	139	48	19	26	10	52	320	280
17	920	.....	620	565	180	48	16	17	9	48	300	262
18	1,180	.....	538	460	134	39	15	14	12	38	280	245
19	920	.....	435	460	121	39	20	12	15	33	280	198
20	485	.....	1,120	388	108	60	17	12	16	74	565	180
21	920	.....	985	342	94	90	19	13	25	280	410	210
22	538	.....	795	365	101	71	18	16	300	101	320	210
23	410	.....	620	342	245	60	16	16	320	71	280	207
24	538	.....	675	280	1,120	50	15	15	116	71	245	280
25	388	.....	735	280	485	41	15	13	80	320	245	300
26	320	.....	1,920	262	280	41	13	12	61	1,310	228	280
27	342	.....	3,440	245	210	42	20	12	39	1,310	228	204
28	300	920	1,990	300	280	41	26	13	30	538	228	153
29	245	.....	1,240	538	1,050	35	49	22	26	365	342	.....
30	300	.....	855	388	460	25	44	44	23	280	320	.....
31	280	.....	1,440	.....	280	.....	32	33	.....	210	.....	.....

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge Feb. 8–27, estimated 144 second-feet, Dec. 29–31, 155 second-feet, from discharge measurement and study of climatologic data.

Monthly discharge of Westfield River at Knightville, Mass., for 1913.

[Drainage area, 162 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	1,440	245	643	3.97	4.58	B.
February	920	.....	212	1.31	1.36	D.
March	3,440	175	864	5.33	6.14	C.
April	1,850	245	607	3.75	4.18	B.
May	1,120	94	245	1.51	1.74	B.
June	186	25	78.0	.482	.54	B.
July	49	12	20.7	.128	.15	C.
August	44	4	15.7	.097	.11	C.
September	320	9	47.4	.293	.33	B.
October	1,310	30	194	1.20	1.38	B.
November	1,710	121	381	2.35	2.62	B.
December	920	153	315	1.94	2.24	B.
The year	3,440	4	303	1.87	25.37	

MIDDLE BRANCH OF WESTFIELD RIVER AT GOSS HEIGHTS, MASS.

Location.—At a highway bridge in Goss Heights, about 1½ miles above the village of Huntington and half a mile above the confluence of the Middle Branch and the North Branch of Westfield River.

Records available.—July 14, 1910, to December 31, 1913.

Drainage area.—53 square miles.

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Gages.—Barrett & Lawrence automatic gage on upstream side of bridge abutment on right bank, referred to a hook gage in the well. Prior to September 8, 1912, a chain gage on the upstream side of the bridge.

Channel and control.—Coarse gravel and bowlders.

Discharge measurements.—Made from the highway bridge or by wading.

Winter flow.—Seriously affected by ice.

Regulation.—Flow somewhat affected by the operation of a small power plant about 2 miles above the station.

Floods.—The high water of March 25–30, 1913, reached a crest elevation of 5.38 feet gage height about 3 p. m. March 27 as recorded by the automatic gage. The corresponding discharge was approximately 2,600 second-feet, or 49 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Middle Branch of Westfield River at Goss Heights, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 7	C. S. De Golyer	1.88	208	Aug. 8	C. H. Pierce	0.92	3.4
Feb. 10	do	[a] 1.64	55.0	Sept. 6	do	1.09	12.4
14	R. S. Barnes	[a] 1.84	46.7	6	do	1.09	11.2
Mar. 26	O. W. Hartwell	3.64	1,140				

[a] Measurement made under complete ice cover 300 feet below the gage.

Daily gage height, in feet, of Middle Branch of Westfield River at Goss Heights, Mass., for 1913.

[Monroe Rising, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.02	1.70	5.48	2.29	1.41	1.49	1.05	1.03	1.03	1.04	1.36	1.76
2	1.84	1.46	4.86	1.95	1.35	1.45	1.05	1.01	1.02	1.25	1.32	1.77
3	2.32	1.50	4.51	1.86	1.30	1.40	1.06	.99	1.01	1.29	1.32	1.80
4	2.33	1.56	4.06	1.81	1.31	1.39	1.02	.97	1.00	1.20	1.29	1.83
5	1.90	1.52	4.31	2.19	1.29	1.36	1.03	.96	1.08	1.12	1.28	1.77
6	1.75	1.58	3.40	2.00	1.27	1.29	1.00	.94	1.08	1.13	1.26	1.72
7	1.82	1.61	3.31	1.85	1.25	1.29	1.00	.93	1.05	1.11	1.24	2.05
8	2.68	1.61	3.51	1.75	1.21	1.30	1.00	.92	1.03	1.10	1.31	2.31
9	2.12	1.57	4.10	1.69	1.18	1.24	.98	.92	1.00	1.07	3.42	1.97
10	1.83	1.56	4.88	1.62	1.25	1.20	.98	.91	.99	1.03	3.02	1.92
11	1.82	1.65	4.55	2.36	1.27	1.20	.97	.90	.98	1.07	2.29	1.89
12	2.41	1.72	3.07	3.28	1.25	1.19	.98	.89	.99	1.19	2.04	1.98
13	2.00	1.72	1.70	2.52	1.24	1.17	.96	.86	.97	1.30	1.93	1.91
14	1.77	1.77	2.56	2.41	1.24	1.16	.96	.....	.91	1.21	1.87	1.78
15	1.69	1.77	2.82	2.11	1.22	1.13	.95	.96	.92	1.16	1.86	1.74
16	1.66	1.77	2.42	2.46	1.29	1.13	.95	.93	.92	1.14	1.82	1.71
17	1.99	1.73	1.86	1.83	1.32	1.11	.95	.91	.93	1.12	1.81	1.68
18	2.16	1.68	1.69	1.77	1.31	1.10	.95	.93	.94	1.09	1.79	1.62
19	1.98	1.67	1.63	1.72	1.29	1.11	.94	.88	.94	1.07	1.78	1.59
20	1.73	1.70	1.95	1.67	1.23	1.15	.94	.88	.95	1.28	1.98	1.77
21	1.92	1.80	2.11	1.61	1.22	1.21	.93	.88	.99	1.48	1.94	1.84
22	1.70	2.45	1.85	1.59	1.25	1.17	.93	.88	1.48	1.31	1.85	1.65
23	1.68	2.53	1.68	1.57	1.47	1.13	.93	.90	1.41	1.24	1.78	1.48
24	1.70	2.05	1.92	1.55	2.18	1.09	.93	.91	1.23	1.18	1.70	1.57
25	1.61	1.89	1.94	1.51	2.24	1.08	.92	.92	1.15	1.72	1.68	1.58
26	1.52	1.80	2.33	1.49	1.53	1.08	.91	.88	1.10	3.08	1.69	1.55
27	1.50	1.75	4.08	1.49	1.45	1.08	.91	.90	1.05	2.57	1.65	1.60
28	1.45	5.75	2.94	1.50	1.60	1.09	.98	.89	1.05	1.83	1.60	1.89
29	1.46	.....	2.27	1.62	2.19	1.03	1.17	.98	1.05	1.62	1.69	1.91
30	1.47	.....	2.09	1.51	1.77	1.03	1.10	1.02	1.04	1.51	1.77	1.84
31	1.44	.....	2.15	.....	1.59	.....	1.08	1.03	.....	1.43	.....	1.75

NOTE.—Discharge relation Feb. 3 to Mar. 12 and Dec. 27–31 affected by ice.

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Daily discharge, in second-feet, of Middle Branch of Westfield River at Goss Heights, Mass., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	228	130	.....	330	59	77	8.9	7.9	7.9	8.4	49	146
2	170	70	.....	204	47	67	8.9	6.9	7.4	30	41	149
3	343	.....	.....	176	38	57	9.4	6.0	6.9	36	41	158
4	348	.....	.....	161	39	55	7.4	5.2	6.4	23	36	167
5	188	.....	.....	290	36	49	7.9	4.8	11	14	35	149
6	143	.....	.....	221	33	36	6.4	4.0	11	15	32	135
7	164	.....	.....	173	30	36	6.4	3.6	8.9	13	29	238
8	519	.....	.....	143	24	38	6.4	3.2	7.9	12	39	339
9	263	.....	.....	127	20	29	5.6	3.2	6.4	10	984	211
10	167	.....	.....	109	30	23	5.6	2.9	6.0	7.9	723	194
11	164	.....	.....	361	33	23	5.2	2.6	5.6	10	330	185
12	384	.....	.....	892	30	21	5.6	2.3	6.0	21	235	176
13	221	.....	130	436	29	19	4.8	1.6	5.2	38	198	161
14	149	.....	456	384	29	18	4.8	3.2	2.9	24	179	152
15	127	.....	599	260	26	15	4.4	4.8	3.2	18	176	140
16	119	.....	388	406	36	15	4.4	3.6	3.2	16	164	132
17	218	.....	176	167	41	13	4.4	2.9	3.6	14	161	124
18	278	.....	127	149	39	12	4.4	3.6	4.0	12	155	109
19	214	.....	112	135	36	13	4.0	2.0	4.0	10	152	102
20	138	.....	204	122	27	17	4.0	2.0	4.4	35	214	149
21	194	.....	260	107	26	24	3.6	2.0	6.0	75	201	170
22	130	.....	173	102	30	19	3.6	2.0	75	39	173	117
23	124	.....	124	97	72	15	3.6	2.6	59	29	152	75
24	130	.....	194	92	286	12	3.6	2.9	27	20	130	97
25	107	.....	201	82	310	11	3.2	3.2	17	135	124	99
26	84	.....	605	77	87	11	2.9	2.0	12	762	127	92
27	80	.....	1,470	77	67	11	2.9	2.6	8.9	461	117	85
28	67	.....	672	80	104	12	5.6	2.3	8.9	167	104	75
29	70	.....	322	109	290	7.9	19	5.6	8.9	109	127	67
30	72	.....	252	82	149	7.9	12	7.4	8.4	82	149	61
31	65	.....	274	.....	102	.....	11	7.9	.....	63	.....	55

NOTE.—Discharge determined from a rating curve fairly well defined below 1,200 second-feet. Mean discharge for February estimated 72 second-feet; Mar. 1–12, estimated 120 second-feet from discharge measurements and climatologic data. Discharge Dec. 27–31 determined from a backwater hydrograph based on discharge measurements made in January, 1914.

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Monthly discharge of Middle Branch of Westfield River at Goss Heights, Mass., for 1913.

[Drainage area 53 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	519	65	183	3.45	3.98	B.
February	.....	.....	72.0	1.36	1.42	C.
March	1,470	.....	264	4.98	5.74	C.
April	892	77	205	3.87	4.32	A.
May	310	20	71.1	1.34	1.54	A.
June	77	7.9	25.5	.481	.54	B.
July	19	2.9	6.13	.116	.13	C.
August	7.9	1.6	3.77	.071	.08	C.
September	75	2.9	11.8	.223	.25	B.
October	762	7.9	74.5	1.41	1.63	B.
November	984	29	179	3.38	3.77	A.
December	339	55	139	2.62	3.02	A.
The year	1,470	1.6	103	1.94	26.42	

WESTFIELD LITTLE RIVER NEAR WESTFIELD,[1] MASS.

Location.—In the town of Russell at the diversion dam of the Springfield waterworks, 3 miles below the confluence of Pebble and Borden brooks, and about 3 miles west of Westfield.

Records available.—March 1, 1910, to December 31, 1913; July 13, 1905, to December 31, 1909, at a point below Borden Brook.

Drainage area.—48 square miles. (43 square miles at former location.)

Regulation.—Flow affected by storage in a reservoir on Borden Brook about 5 miles above the station. Results corrected for storage.

Diversions.—Water is diverted at the station for the municipal water supply of Springfield. The amount of this diversion is measured by a 54-inch Venturi meter with a continuous recording chart.

Computations of discharge.—Discharge determined from a continuous record of the head on the diversion dam which has a crest length of 155.4 feet above gage height 2.55 feet. Below this height all the water passes over a 12-foot sharp-crested weir without end contractions.

Cooperation.—Data collected and compiled under the direction of E. E. Lochridge, chief engineer, board of water commissioners, Springfield, Mass.

[1] Formerly described as near Blandford, Mass.

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Daily discharge, in second-feet, of Westfield Little River near Westfield, Mass., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	95.6	104.9	161.5	392.5	163.9	285.7	11.62	6.21	18.71	6.89	50.47	52.27
2	66.4	93.6	166.8	538.5	118.7	141.5	9.64	8.51	46.90	8.46	82.06	82.24
3	57.6	96.9	133.9	625.9	96.5	114.4	10.05	10.03	52.31	9.71	53.40	189.57
4	51.3	104.1	122.8	304.8	83.9	84.9	3.86	7.31	33.21	8.88	35.14	123.07
5	96.9	91.6	119.6	250.9	80.7	66.9	.....	8.66	22.51	3.12	33.36	84.06
6	51.8	109.7	121.4	377.4	187.3	60.5	.....	7.04	30.12	3.69	40.27	160.35
7	60.8	96.0	119.4	604.9	193.3	62.1	.....	5.50	19.73	7.05	192.66	154.57
8	51.5	96.0	121.8	489.3	151.7	54.9	.....	6.13	16.22	.....	363.63	110.50
9	70.0	100.6	155.9	277.9	159.0	43.1	3.27	8.12	18.01	1.41	187.52	70.06
10	73.0	91.2	154.1	211.4	155.4	35.0	3.04	6.12	9.05	3.00	133.33	71.52
11	49.8	93.2	136.2	214.7	129.7	29.9	3.41	19.73	9.78	3.02	75.55	56.16
12	45.8	77.9	139.5	182.2	110.1	27.1	2.90	7.96	7.64	.88	78.21	58.95
13	44.9	95.8	628.0	179.6	112.7	26.2	10.19	4.73	20.90	.82	71.89	39.79
14	49.5	98.6	396.7	140.0	103.6	25.1	7.46	3.88	6.26	.99	142.94	41.57
15	71.5	46.6	692.7	133.4	105.2	21.7	2.01	.....	.....	1.13	136.77	47.54
16	73.4	55.8	1,306.2	249.5	276.7	19.6	2.90	6.57	16.72	8.20	100.41	101.87
17	69.6	49.2	922.6	239.6	353.4	19.6	3.02	7.17	11.66	6.54	74.79	59.09
18	45.9	44.0	855.0	274.7	216.7	19.3	4.79	19.92	20.03	5.90	64.45	44.66
19	80.9	46.3	913.4	287.6	127.2	19.0	9.74	26.15	8.79	6.75	61.50	122.34
20	258.0	99.2	763.3	207.3	102.0	17.3	8.33	37.02	17.00	1.60	54.99	109.60
21	118.9	225.5	401.4	158.4	92.6	18.8	16.54	22.30	7.78	1.08	41.83	80.34
22	98.6	325.2	193.7	139.3	97.8	20.6	25.22	16.43	16.40	2.06	40.33	47.38
23	79.0	265.9	134.2	165.4	79.7	14.1	15.96	16.84	7.04	123.46	47.75	52.30
24	56.6	261.0	120.8	143.4	81.4	4.2	16.21	16.62	17.67	302.93	98.83	44.47
25	30.7	208.0	117.9	140.9	114.6	13.6	13.38	12.09	10.37	192.09	187.61	35.00
26	41.1	204.7	97.5	111.7	86.8	8.7	5.44	8.39	19.33	146.49	129.94	44.59
27	40.4	355.1	101.1	97.7	68.4	6.9	5.63	12.50	7.98	94.21	101.76	191.13
28	98.0	280.2	129.6	95.4	48.6	9.2	.....	8.55	19.13	72.42	66.17	183.05
29	96.5	215.7	556.7	94.5	53.9	13.0	.....	8.27	16.44	44.11	58.90	120.30
30	122.0	.....	554.9	168.1	462.6	11.1	.....	14.89	9.42	45.42	40.25	461.30
31	96.0	.....	387.5	.....	485.6	.....	.....	13.85	.....	40.84	.....	521.02
1913.												
1	316	90	155	175	95	65	3.2	2.3	0.5	9.7	50	110
2	170	58	118	141	65	47	3.7	7.9	2.5	65	51	96
3	265	44	80	115	63	49	4.0	15	3.7	31	45	102
4	315	49	65	110	55	39	2.7	.....	4.7	19	42	79
5	184	39	51	130	51	32	2.0	.....	17	15	31	73
6	139	36	43	119	49	29	.7	1.1	13	13	28	52
7	157	39	40	108	47	32	.....	2.4	.....	7.3	35	224
8	504	43	40	95	32	38	.....	2.1	.....	5.2	66	252
9	368	38	48	89	26	30	.....	5.4	.....	5.6	649	155
10	203	34	101	63	26	23	.....	.5	.....	6.9	485	95
11	164	31	112	225	24	21	.....	1.4	.....	19	226	97
12	243	33	154	469	25	19	.....	3.0	.....	35	149	76
13	192	27	111	306	24	18	1.4	1.2	.....	38	115	75
14	136	27	273	235	24	17	.....	1.4	.....	19	90	72
15	116	32	357	189	22	15	1.4	4.5	.....	18	94	54
16	102	32	314	166	25	17	1.5	2.3	.....	27	87	55
17	119	29	200	134	29	2.4	1.2	.3	.....	14	59	61
18	154	24	137	102	26	5.8	15	2.6	.1	14	81	57
19	136	23	121	94	29	6.3	.....	.8	14	7.0	95	42
20	112	23	187	78	23	22	.4	.6	14	40	144	33
21	142	51	224	66	29	19	1.8	.5	29	60	111	41
22	122	76	190	64	33	15	1.4	3.4	49	26	105	49
23	111	170	145	66	138	5.9	1.8	3.2	31	28	87	45
24	135	86	172	62	389	8.4	1.4	1.8	25	36	62	66
25	125	47	204	55	206	4.5	2.4	4.2	15	201	62	81
26	104	40	466	41	107	9.5	1.8	1.4	8.0	872	45	64
27	96	50	1,120	37	64	.1	2.3	1.6	2.4	801	51	63
28	76	120	524	156	217	20	12	1.0	1.9	314	50	35
29	47	.....	279	167	485	14	5.1	27	7.0	168	126	48
30	61	.....	226	120	241	.....	4.0	7.0	8.4	106	124	41
31	67	.....	208	.....	112	.....	3.4	4.1	.....	80	.....	49

NOTE.—Discharge determined by subtracting from the total flow at the diversion dam the amount of water apparently released from the Borden Brook reservoir or by adding the amount of water apparently stored in the reservoir as indicated by gage heights of the water surface in the reservoir. As no allowance has been made for evaporation and seepage from the reservoir the results show the natural flow at the diversion dam only approximately. For days when no discharge values are given the apparent storage release was equal to or greater than the total flow at the diversion dam.

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Monthly discharge of Westfield Little River near Westfield, Mass., for 1912–13.

[Drainage area, 48.0 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	258.0	30.7	75.6	1.58	1.82
February	355.1	44.0	136.5	2.84	3.06
March	1,306.2	97.5	352.5	7.34	8.46
April	625.9	94.5	249.9	5.20	5.80
May	485.6	48.6	151.6	3.16	3.64
June	285.7	4.2	43.1	.898	1.00
July	25.22	.....	6.28	.131	.15
August	37.02	.....	11.53	.240	.28
September	52.31	.....	17.23	.359	.40
October	302.93	.....	37.10	.752	.87
November	363.63	33.36	94.89	1.98	2.21
December	521.02	35.00	114.86	2.39	2.76
The year	1,306.2	.....	107.8	2.25	30.45
1913.					
January	504	47	167	3.48	4.01
February	170	23	49.7	1.03	1.07
March	1,120	40	209	4.34	5.00
April	469	37	132	2.75	3.07
May	485	22	89.7	1.87	2.16
June	65	.....	20.8	.435	.49
July	15	.....	2.4	.050	.06
August	27	.....	3.5	.074	.09
September	49	.....	8.2	.170	.19
October	872	5.2	100	2.08	2.40
November	649	28	115	2.39	2.67
December	252	33	78.7	1.64	1.89
The year	1,120	.....	81.7	1.70	23.10

BORDEN BROOK NEAR WESTFIELD,[1] MASS.

Location.—At the outlet of Borden Brook reservoir in the town of Granville, 2 miles above the confluence of Borden and Pebble brooks, and about 8 miles west of Westfield.

Records available.—January 1, 1910, to December 31, 1913.

Drainage area.—8 square miles.

Regulation.—Flow affected by storage in Borden Brook reservoir. Results corrected for storage.

Computations of discharge.—Discharge determined from a continuous record of the head on a 5-foot sharp-crested weir without end contractions.

Cooperation.—Data collected and compiled under the direction of E. E. Lochridge, chief engineer, board of water commissioners, Springfield, Mass.

[1] Formerly described as near Blandford, Mass.

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Daily discharge, in second-feet, of Borden Brook near Westfield, Mass., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	22	11	9.0	62	18	62	3.2		10	6.7	20	11
2	11	.....	8.6	97	18	14	.....		11	6.7	11	22
3	.4	.....	6.8	105	13	7.8	.....		11	8.2	9.3	11
4	.4	11	5.0	73	13	3.6	.....		.....	8.2	.....	11
5	33	.....	4.6	54	13	1.3	.....		.....	.....	.....	11
6	22	11	3.9	51	13	.4	.....		9.3	.....	11	11
7	22	.....	3.5	86	13	.4	.....		.....	7.0	90	11
8	.....	.....	3.5	68	18	.4	.....		.....	.....	101	11
9	11	11	3.9	60	23	.3	.....		.....	.....	40	.....
10	11	.....	3.9	60	23	.2	.....		.....	.....	42	11
11	.....	.....	2.8	14	18	.1	.....	0.2	.....	.....	9.3	.....
12	.....	.....	20	31	19	.1	.....	.....	.....	.....	22	11
13	.....	11	34	12	19	.1	.....	.....	14	.....	20	11
14	.....	.....	34	31	13	.1	.....	.....	.....	.....	42	.....
15	11	.....	101	46	14	.....	.....	.....	.....	.....	11	.....
16	.....	11	120	49	48	.....	.....	.....	11	.....	11	.....
17	.....	.....	68	29	59	.....	.....	.....	6.7	.....	11	.....
18	.....	.....	58	34	30	.....	.....	.....	10	.....	11	.....
19	4.4	11	58	62	8.0	.....	.....	.....	.9	.....	11	11
20	2.2	.....	58	54	3.6	.....	.....	.....	10	.....	9.3	11
21	.....	45	43	24	3.9	.....	.8	.....	.9	.....	.....	11
22	11	9.3	26	42	2.8	.....	.....	.....	10	.....	.....	.....
23	11	.....	21	14	2.5	.....	.....	.....	.....	78	11	11
24	.....	.....	17	14	5.4	.....	.....	.....	17	59	22	11
25	.....	19	16	16	7.6	6.4	.....	.....	8.2	29	11	.....
26	11	9.3	11	8.0	5.1	.....	6.7	9.1	18	39	11	11
27	11	5.8	4.4	8.0	2.8	.....	.....	8.2	1.6	31	11	22
28	11	11	24	14	1.3	.....	.....	6.7	10	31	11	22
29	.....	9.5	44	14	21	.....	.....	.....	10	9.3	11	11
30	11	.....	64	17	60	.....	7.4	9.5	.9	11	.....	57
31	.....	.....	64	.....	77	.....	.....	10	.....	9.3	.....	46
1913.												
1	58	11	18	25	16	11	.....	.....	.....	.....	.....	22
2	35	10	19	11	2.4	3.1	.....	5.6	.....	.....	11	11
3	28	.....	13	17	8.1	7.2	.....	.....	.....	.....	9.3	22
4	28	5.6	10	28	6.2	4.6	.....	.....	.....	.....	9.3	11
5	12	5.0	3.4	13	5.4	2.8	.....	.....	.....	.....	.....	11
6	15	4.3	3.4	19	5.0	2.3	.....	1.4	.....	.....	.....	.....
7	47	3.1	3.9	16	4.3	2.6	.....	.....	.....	.....	9.3	87
8	25	2.8	3.5	14	.....	4.3	.....	.....	.....	.....	29	43
9	33	2.2	14.6	.3	.....	3.6	.....	2.9	.....	.....	161	32
10	15	1.7	19	8.5	.....	.....	.....	.....	.....	.....	80	.....
11	15	1.7	17	113	.....	.....	.....	.....	.....	14	40	22
12	15	.....	32	121	.....	.....	.....	1.4	3.9	5.8	20	22
13	15	.....	30	81	.....	.....	15	.....	.....	9.3	20	11
14	15	.....	47	45	.....	.....	.....	.....	.....	.....	9.3	11
15	19	.....	98	31	.....	.....	.....	2.9	2.2	.....	20	.....
16	19	.....	65	18	.....	.....	.....	.....	14	9.3	20	11
17	22	.....	45	20	.....	.....	.....	.....	4.4	.....	.....	11
18	36	.....	25	17	.....	.....	.....	1.4	.....	.....	20	9.3
19	15	.....	26	14	.....	1.1	.....	.....	.....	8.2	20	9.3
20	18	.....	46	11	.....	18	.1	.....	.....	27	31	.....
21	18	9.5	64	.....	10	.....	.....	.....	14	18	11	.....
22	17	17	46	6.4	5.7	.....	.....	1.9	9.3	18	22	9.3
23	29	13	24	6.7	90	.....	.....	.....	.....	27	20	9.3
24	12	11	19	6.7	78	2.7	.....	.....	9.3	34	11	9.3
25	19	.....	162	5.8	41	.....	.....	2.9	.....	92	11	19
26	16	3.8	123	5.0	25	5.6	.....	.....	3.8	221	.....	9.3
27	13	17	164	6.3	12	.....	.....	.....	.....	113	9.3	19
28	11	13	110	35	103	.....	5.3	.....	.....	47	11	2.7
29	.....	.....	64	25	62	.....	.....	22	.....	47	32	18
30	5.2	.....	44	11	44	.....	.....	8.2	.....	27	31	9.5
31	17	.....	48	.....	21	.....	1.4	4.5	.....	27	.....	9.5

NOTE.—Discharge determined by subtracting from the amount passing over the weir the amount of water apparently released from the reservoir or by adding the amount apparently stored in the reservoir, as indicated by gage heights of the water surface in the reservoir. As no allowance has been made for evaporation and seepage from the reservoir the results show the natural flow at the outlet of the reservoir only approximately. For days when no discharge values are given, the apparent storage release was equal to or greater than the amount passing over the weir.

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Monthly discharge of Borden Brook near Westfield, Mass., for 1912–13.

[Drainage area, 8 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1912.					
January	33		6.98	0.872	1.01
February	45		6.41	.801	.86
March	120	2.8	30.4	3.80	4.38
April	105	8.0	41.6	5.20	5.80
May	77	1.3	19.2	2.40	2.77
June	62		3.24	.405	.45
July	7.4		.584	.073	.08
August	10		1.41	.176	.20
September	18		5.68	.710	.79
October	78		10.8	1.35	1.56
November	101		18.6	2.32	2.59
December	57		11.5	1.44	1.66
The year	120		13.0	1.62	22.15
1913.					
January	58		20.7	2.59	2.99
February	17		4.70	.588	.61
March	164		41.7	5.21	6.01
April	121		24.4	3.05	3.40
May	103		17.4	2.18	2.51
June	18		2.29	.286	.32
July	15		.703	.088	.10
August	22		1.78	.222	.25
September	14		2.03	.254	.28
October	221		24.0	3.00	3.46
November	161		22.2	2.78	3.10
December	87		14.8	1.85	2.13
The year	221		14.8	1.85	25.17

WEST BRANCH OF FARMINGTON RIVER NEAR NEW BOSTON, MASS.

Location.—At a highway bridge a quarter of a mile below Clam River, and about 1 mile south of New Boston.

Records available.—May 27 to December 31, 1913.

Drainage area.—92.7 square miles.

Gage.—Barrett & Lawrence automatic gage installed June 11, 1913, on left bank at downstream side of bridge, referred to a hook gage in the well.

Channel and control.—Rocky and filled with bowlders.

Discharge measurements.—Made from cable 120 feet below gage, or by wading.

Regulation.—Flow affected by storage in Otis reservoir about 5 miles above New Boston, and by operation of a woodworking shop just above the station.

Winter flow.—Affected by ice.

Floods.—The high water of March, 1913, reached a maximum stage of about 6 feet gage height as determined from high-water marks by engineers of the Geological Survey.

Accuracy.—Results good for discharge below 200 second-feet. Above this limit results somewhat approximate.

Discharge measurements of West Branch of Farmington River near New Boston, Mass., during 1913.

[Made by R. S. Barnes.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
June 9	3.11	64	Oct. 15	2.96	42.4
13	3.68	157	15	2.95	41.5
Oct. 9	2.30	6.6	15	2.98	43.9
9	2.70	29.6			

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Daily gage height, in feet, of West Branch of Farmington River near New Boston, Mass., for 1915.

[Asa Sherwood, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.64	3.38	3.49	3.33	2.75	3.58	3.75
2	.....	3.54	3.05	3.48	2.65	2.98	3.48	3.66
3	.....	3.43	2.55	3.48	2.43	2.95	3.40	3.63
4	.....	3.32	3.26	3.45	2.45	2.85	3.35	.....
5	.....	3.20	3.32	3.46	3.00	2.79	3.35	3.51
6	.....	3.20	3.34	3.46	3.23	2.65	3.25	3.45
7	.....	3.30	3.31	3.47	3.22	2.63	3.11	3.90
8	.....	3.40	3.32	3.45	3.15	2.65	3.15	.....
9	.....	3.11	3.54	3.48	3.08	2.60	5.02	.....
10	.....	3.08	3.49	3.45	3.06	2.60	5.35	.....
11	.....	3.06	3.56	3.43	3.03	2.60	4.60	3.70
12	.....	3.68	3.54	3.39	3.04	3.15	4.15	3.65
13	.....	3.63	3.54	3.37	3.01	3.18	3.85	3.55
14	.....	3.00	3.53	3.39	2.99	2.95	3.78	3.49
15	.....	3.18	3.53	3.44	2.85	2.88	3.70	3.47
16	.....	3.47	3.52	3.54	2.75	2.83	3.65	3.40
17	.....	3.43	3.54	3.56	2.78	2.75	3.60	3.38
18	.....	3.45	3.52	3.55	2.75	2.80	3.65	3.30
19	.....	3.45	3.54	3.55	2.75	2.95	3.77	3.33
20	.....	3.45	3.53	3.47	2.65	3.13	4.30	3.28
21	.....	3.35	3.50	3.46	2.80	3.32	4.05	3.27
22	.....	2.80	3.49	3.48	3.64	3.03	3.90	3.25
23	.....	3.00	3.48	3.34	3.28	2.93	3.75	3.18
24	.....	3.39	3.50	2.48	2.85	2.85	3.58	3.35
25	.....	3.38	3.49	2.85	2.65	3.84	3.61	.....
26	.....	3.39	3.47	3.35	2.65	5.78	3.48	3.35
27	3.41	3.41	3.48	2.95	2.62	5.80	3.35	3.27
28	3.80	3.41	3.53	3.42	2.58	4.84	3.30	3.35
29	5.05	3.39	2.84	3.45	2.56	4.30	3.75	3.35
30	4.22	3.37	3.47	3.46	2.62	3.98	3.92	3.35
31	3.79	.....	3.49	3.43	.....	3.75	.....	3.32

Daily discharge, in second-feet, of West Branch of Farmington River near New Boston, Mass., for 1915.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	149	100	118	93	32	121	156
2	.....	128	58	117	26	51	104	137
3	.....	108	19	117	12	48	91	131
4	.....	92	84	112	14	40	84	120
5	.....	76	92	113	53	35	84	109
6	.....	76	95	113	80	26	71	99
7	.....	89	90	115	79	24	56	191
8	.....	103	92	112	70	26	60	250
9	.....	65	128	117	62	22	594	200
10	.....	62	118	112	60	22	744	160
11	.....	60	132	108	56	18	425	145
12	.....	158	128	102	57	60	264	135
13	.....	147	128	99	54	63	179	116
14	.....	53	126	102	52	42	163	105
15	.....	74	126	110	40	37	145	102
16	.....	115	124	128	32	33	135	91
17	.....	108	128	132	35	28	125	88
18	.....	112	124	130	32	31	135	77
19	.....	112	128	130	32	42	160	81
20	.....	112	126	115	26	58	315	75
21	.....	96	120	113	36	80	232	73
22	.....	36	118	117	149	49	191	71
23	.....	53	117	95	86	40	156	63
24	.....	102	120	15	40	34	121	84
25	.....	100	118	40	26	177	127	84
26	.....	102	115	96	26	940	104	84
27	105	105	117	48	23	950	84	73
28	186	105	126	106	21	521	77	84
29	650	102	39	112	20	315	156	84
30	309	99	115	113	23	213	196	84
31	184	.....	118	108	.....	156	.....	80

NOTE.—Discharge determined from two rating curves, both well defined below 200 second-feet. Discharge Dec. 4, 8–10, and 25, estimated by comparison with records at adjacent stations.

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Monthly discharge of West Branch of Farmington River near New Boston, Mass., for 1913.

[Drainage area, 92.7 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
May 27-31	650	105	287	3.10	0.58	C.
June	158	36	96.6	1.04	1.16	A.
July	132	19	109	1.18	1.36	A.
August	132	15	105	1.13	1.30	A.
September	149	12	47.2	.509	.57	A.
October	950	18	136	1.47	1.70	C.
November	744	56	183	1.97	2.20	C.
December	250	63	111	1.20	1.38	C.

HOUSATONIC RIVER BASIN.

HOUSATONIC RIVER NEAR GREAT BARRINGTON, MASS.

Location.—At a highway bridge about a quarter of a mile northeast of the Van Deusenville station of the New York, New Haven & Hartford Railroad, Berkshire division, and 2 miles north of Great Barrington.

Records available.—May 17 to December 31, 1913.

Drainage area.—280 square miles.

Gage.—Inclined staff attached to concrete anchorages on the downstream side of the left abutment of the highway bridge; vertical high-water section attached to the bridge abutment.

Channel and control.—Sand, gravel, and alluvial deposits.

Discharge measurements.—Made from the upstream side of the highway bridge or by wading.

Regulation.—Flow not seriously affected by the dam of a paper mill about a mile above the station as the mill runs continually throughout the twenty-four hours.

Winter flow.—Affected by ice.

Floods.—The high water of March, 1913, reached a maximum stage of about 8 feet gage height as determined from high-water marks by engineers of the Geological Survey.

Accuracy.—Results fair.

Discharge measurements of Housatonic River near Great Barrington, Mass., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 21	C. H. Pierce	2.19	409	Oct. 18	R. S. Barnes	1.48	129
Aug. 7	.....do	1.47	160	19	.....do	.74	12.7

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Daily gage height, in feet, of Housatonic River near Great Barrington, Mass., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.50	1.90	1.50	0.60	1.40	1.80	1.80
2	.....	2.2	1.75	1.20	1.06	1.40	1.15	2.1
3	.....	2.0	1.75	1.05	1.10	1.34	1.80	2.4
4	.....	2.2	1.45	1.35	1.12	1.24	1.65	2.0
5	.....	2.1	1.10	1.50	1.18	1.04	1.50	2.05
6	.....	1.75	1.10	1.48	1.29	1.60	1.75	2.1
7	.....	2.1	1.75	1.28	.92	1.29	1.85	2.0
8	.....	1.28	1.70	1.48	1.28	1.35	1.49	2.4
9	.....	1.90	1.70	1.30	1.21	1.44	1.04	3.2
10	.....	2.2	1.75	.75	1.25	1.60	3.0	2.6
11	.....	2.1	1.70	.91	1.28	1.48	3.4	2.55
12	.....	2.0	1.75	.81	1.28	.88	3.2	2.55
13	.....	2.15	1.40	1.19	.80	1.24	2.65	2.5
14	.....	1.90	1.70	1.06	.56	1.70	2.4	2.15
15	.....	1.10	1.70	.86	1.21	1.40	2.3	2.1
16	.....	1.80	1.70	.91	1.19	1.40	2.15	2.35
17	2.05	1.80	1.70	.84	1.18	1.20	1.80	2.3
18	1.60	2.05	1.65	1.44	1.18	1.18	2.2	2.1
19	2.0	2.1	1.65	.96	1.06	.80	2.2	2.1
20	2.15	2.05	1.35	1.31	1.04	.99	2.35	2.05
21	2.05	2.1	1.75	1.41	.88	1.70	2.35	1.80
22	2.1	2.0	1.70	1.16	1.04	1.45	2.25	2.0
23	2.1	1.70	1.75	1.30	1.30	1.39	2.1	2.15
24	3.2	2.4	1.70	.68	1.35	1.60	1.80	2.05
25	2.6	1.85	1.75	1.31	1.19	1.80	2.1	1.50
26	2.65	1.80	1.75	1.14	1.22	2.7	1.95	2.15
27	2.6	1.80	1.35	1.45	.91	3.9	2.1	2.35
28	2.45	1.75	1.70	1.31	.85	3.3	1.90	1.76
29	2.7	1.35	1.60	1.30	1.42	3.1	2.2	1.92
30	2.85	1.90	1.45	1.06	1.50	2.2	1.80	1.78
31	2.8	.....	1.45	.64	.....	2.1	.....	1.85

NOTE.—Gage heights determined from two readings a day taken at about 7 a. m. and 5 p. m.

Daily discharge, in second-feet, of Housatonic River near Great Barrington, Mass., for 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	165	290	165	3	140	255	255
2	.....	420	240	92	63	140	82	370
3	.....	330	240	62	71	125	255	520
4	.....	420	152	128	75	101	210	330
5	.....	370	71	165	88	60	165	350
6	.....	240	71	160	113	195	240	370
7	.....	370	240	110	38	113	272	330
8	.....	110	225	160	110	128	162	520
9	.....	290	225	115	94	150	60	1,060
10	.....	420	240	16	104	195	910	640
11	.....	370	225	37	110	160	1,220	610
12	.....	330	240	22	110	32	1,060	610
13	.....	395	140	90	21	101	670	580
14	.....	290	225	63	2	225	520	395
15	.....	71	225	29	94	140	470	370
16	.....	255	225	37	90	140	395	495
17	350	255	225	27	88	92	255	470
18	195	350	210	150	88	88	420	370
19	330	370	210	45	63	21	420	370
20	395	350	128	118	60	50	495	350
21	350	370	240	142	32	225	495	255
22	370	330	225	84	60	152	445	330
23	370	225	240	115	115	138	370	395
24	1,060	520	225	8	128	195	255	350
25	640	272	240	118	90	255	370	165
26	670	255	240	79	97	700	310	395
27	640	255	128	152	37	1,620	370	495
28	550	240	225	118	28	1,140	290	243
29	700	128	195	115	145	980	420	298
30	805	290	152	63	165	420	255	249
31	770	.....	152	5	.....	370	.....	272

NOTE.—Discharge determined from a rating curve well defined below 1,300 second-feet. High water measurements secured in March, 1914, were used in developing the rating curve.

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Monthly discharge of Housatonic River near Great Barrington, Mass., for 1913.

[Drainage area, 280 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
May 17-31	1,060	195	546	1.95	1.09	B.
June	520	71	302	1.08	1.20	B.
July	290	71	204	.729	.84	B.
August	165	5	90.0	.321	.37	C.
September	165	2	79.4	.284	.32	C.
October	1,620	21	277	.989	1.14	B.
November	1,220	60	404	1.44	1.61	B.
December	1,060	165	413	1.48	1.71	B.

HOUSATONIC RIVER AT GAYLORDSVILLE, CONN.

Location.—At the covered wooden highway bridge at Gaylordsville, about 2 miles below Tenmile River.

Records available.—October 24, 1900, to December 31, 1913.

Drainage area.—1,020 square miles.

Gage.—Chain attached to the bridge.

Channel and control.—Large bowlders and rocks; channel probably somewhat shifting. At high stages the dam at Milford, Conn., 7 miles below the station, may cause backwater at the gage.

Discharge measurements.—Made from a cable 1¼ miles below the gage.

Regulation.—Flow affected by the operation of a power plant about a mile above the station.

Winter flow.—Affected by ice for short periods.

Floods.—The highest gage height observed during 1913 occurred at 5 p. m. March 27. A study of the gage-height records indicates that the stage probably rose later in the evening to 10.5 or 11. The maximum discharge was probably between 16,000 and 17,000 second-feet. The flood of March, 1913, was not phenomenal at this station.

Cooperation.—Gage heights furnished by United States Weather Bureau and private parties.

Estimates of daily and monthly discharge withheld for additional data.

The following discharge measurement was made by C. S. De Golyer:

January 10, 1913: Gage height, 6.25 feet; discharge, 4,370 second-feet.

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Gage height, in feet, of Housatonic River at Gaylordsville, Mass., for 1913.

[G. H. Munroe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.6	5.1	5.9	7.2	5.6	5.1	3.5	3.0	2.9	3.0	5.3	5.0
2	6.4	5.1	5.8	6.8	5.4	4.8	3.4	3.3	3.4	3.9	4.8	5.1
3	6.4	5.2	5.3	6.5	5.2	4.7	3.5	3.0	2.9	4.6	4.9	5.1
4	6.3	5.1	5.1	6.4	4.9	4.8	3.3	3.2	2.9	4.2	4.7	5.1
5	6.6	5.1	5.1	6.3	4.8	4.8	3.3	3.0	3.1	3.9	4.5	4.9
6	6.3	4.9	5.0	6.3	4.7	4.8	2.8	2.9	3.4	3.9	4.6	4.8
7	6.1	4.9	4.6	6.3	4.9	4.8	3.4	2.9	3.2	3.9	4.5	4.4
8	6.4	4.7	4.7	5.7	4.7	4.7	3.0	2.9	3.3	3.6	4.6	5.6
9	6.7	4.6	4.4	5.7	4.7	4.5	3.2	3.1	3.4	3.4	4.5	5.5
10	6.5	4.4	5.0	5.6	4.4	4.6	3.3	2.7	3.1	3.7	5.7	5.3
11	6.6	4.5	5.3	5.6	4.3	4.5	3.3	3.0	3.0	3.7	5.6	5.3
12	6.8	4.6	5.6	6.5	4.1	4.5	3.4	3.1	3.0	3.5	5.6	4.9
13	6.5	4.8	5.5	7.3	4.5	4.2	2.7	3.1	3.0	4.4	5.6	4.9
14	6.0	4.8	5.7	7.2	4.6	4.0	3.2	2.7	3.0	4.0	5.2	4.9
15	5.7	4.8	6.2	7.0	4.6	3.6	3.2	3.0	2.7	4.0	5.1	5.1
16	5.5	4.7	7.0	6.8	4.6	3.7	3.2	2.9	2.7	3.8	4.9	5.0
17	5.8	4.5	6.7	6.5	4.6	3.5	3.4	2.6	2.9	3.9	5.1	4.9
18	6.1	4.3	6.4	6.1	4.2	3.5	3.3	2.7	2.8	3.6	5.1	5.2
19	6.0	4.5	6.4	5.8	4.4	3.6	3.0	3.0	2.8	3.4	5.1	5.0
20	6.0	4.5	6.2	5.7	4.0	3.7	2.7	3.0	2.8	3.9	5.2	4.7
21	6.3	4.6	6.2	5.5	4.0	4.1	3.4	3.0	2.7	4.1	5.5	4.7
22	6.1	4.8	6.0	5.4	4.3	4.1	2.9	3.0	3.3	3.9	5.3	5.0
23	5.9	5.5	5.9	5.3	4.8	3.7	3.1	3.0	4.1	3.9	4.8	4.9
24	6.0	5.3	5.7	5.3	6.3	3.6	3.1	2.6	3.9	4.1	4.9	5.0
25	5.7	5.0	5.8	5.5	6.1	3.4	3.2	3.2	3.7	5.2	4.8	5.0
26	5.8	4.8	5.8	5.0	5.8	3.4	3.3	3.0	3.5	6.1	4.9	5.0
27	5.7	4.8	6.5	4.9	5.4	3.5	3.0	2.9	3.5	7.8	4.6	4.9
28	5.7	5.5	9.6	5.5	5.4	3.5	3.3	2.6	3.1	7.0	4.9	4.9
29	5.5	.....	9.5	5.7	5.8	2.8	3.3	2.9	3.2	6.2	4.6	4.8
30	5.6	.....	8.9	5.5	5.4	3.2	3.0	4.0	3.2	5.9	5.1	4.9
31	5.8	.....	7.9	.....	5.1	.....	3.0	3.2	.....	5.4	.....	4.9

NOTE.—Gage read once daily at about 8 a. m. Discharge relation probably not seriously affected by ice during 1913.

POMPERAUG RIVER AT BENNETTS BRIDGE, CONN.

Location.—Just above the New York & New England Railroad bridge, about 1,100 feet above the mouth, a quarter of a mile north of Bennetts Bridge, and a mile east of Sandy Hook railroad station.

Records available.—July 30 to December 31, 1913.

Drainage area.—89.3 square miles.

Gage.—Inclined staff on right bank.

Channel and control.—Channel composed of coarse gravel, bowlders, and alluvial deposits. Control formed by large rocks about 100 feet below gage.

Discharge measurements.—Made from a cable at the gage or by wading about 250 feet above the gage.

Regulation.—Flow slightly affected by the operation of power plants at South Britain, 2½ miles above the station.

Winter flow.—Affected by ice.

Accuracy.—Results good.

Discharge measurements of Pomperaug River at Bennetts Bridge, Conn., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 31	C. H. Pierce	1.10	15.6	Oct. 28	A. J. Ellis	3.78	472
Oct. 16	R. S. Barnes	1.59	39.7	29	do	3.46	382
17	do	1.58	39.2	29	do	3.44	380
17	do	1.57	38.6	29	do	3.44	381
27	A. J. Ellis	4.71	801	31	do	3.00	276
28	do	3.80	482	Nov. 3	do	2.66	237

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Daily gage height, in feet, and discharge, in second-feet, of Pomperaug River at Bennetts Bridge, Conn., for 1913.

Day.	July.		August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.12	17	1.31	24	1.31	24	2.9	250	2.55	180
2	.....	.....	1.15	18	1.26	22	2.6	190	2.8	230	2.48	166
3	.....	.....	1.12	17	1.22	21	2.16	109	2.7	210	2.44	158
4	.....	.....	1.10	16	1.20	20	1.80	58	2.65	200	2.38	146
5	.....	.....	1.09	16	1.22	21	1.64	43	2.6	190	2.36	143
6	.....	.....	1.08	15	1.21	20	1.56	38	2.5	170	2.32	136
7	.....	.....	1.16	18	1.22	21	1.50	34	2.46	162	2.41	152
8	.....	.....	1.19	20	1.55	37	1.51	35	2.41	152	3.2	310
9	.....	.....	1.14	18	1.49	34	1.49	34	3.35	355	2.7	210
10	.....	.....	1.12	17	1.34	26	1.46	32	3.7	460	2.55	180
11	.....	.....	1.15	18	1.24	21	1.45	32	3.1	290	2.55	180
12	.....	.....	1.16	18	1.22	21	2.05	92	2.9	250	2.46	162
13	.....	.....	1.12	17	1.25	22	2.05	92	2.8	230	2.40	150
14	.....	.....	1.15	18	1.20	20	1.76	54	2.8	230	2.42	154
15	.....	.....	1.18	19	1.20	20	1.64	43	2.75	220	2.42	154
16	.....	.....	1.19	20	1.19	20	1.60	40	2.7	210	2.32	136
17	.....	.....	1.15	18	1.29	24	1.51	35	2.95	260	2.32	136
18	.....	.....	1.19	20	1.26	22	1.49	34	2.85	240	2.29	130
19	.....	.....	1.28	23	1.26	22	1.49	34	2.7	210	2.19	113
20	.....	.....	1.28	23	1.36	27	1.70	48	2.9	250	2.10	99
21	.....	.....	1.22	21	1.40	29	2.20	115	2.75	220	2.18	112
22	.....	.....	1.18	19	1.78	56	1.85	64	2.65	200	2.5	170
23	.....	.....	1.24	22	1.99	83	1.64	43	2.6	190	2.44	158
24	.....	.....	1.18	19	1.59	39	1.68	46	2.5	170	3.6	430
25	.....	.....	1.19	20	1.46	32	4.6	760	2.48	166	2.8	230
26	.....	.....	1.16	18	1.39	28	6.0	1,520	2.44	158	3.1	290
27	.....	.....	1.14	18	1.38	28	5.2	1,040	2.39	148	2.7	210
28	.....	.....	1.18	19	1.29	24	3.9	520	2.35	141	2.42	154
29	.....	.....	1.18	19	1.23	23	3.45	385	2.75	220	2.36	142
30	1.10	16	1.58	39	1.28	23	3.20	310	2.65	200	2.30	122
31	1.10	16	1.42	30	.....	.....	3.0	270	.....	.....	2.29	138

NOTE.—Gage read twice daily at about 7 a. m. and 6 p. m. Discharge determined from a rating curve well defined below 2,600 second-feet.

Monthly discharge of Pomperaug River at Bennetts Bridge, Conn., for 1913.

[Drainage area, 89.3 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
August	39	15	19.7	0.221	0.25	A.
September	83	20	27.7	.310	.35	A.
October	1,520	24	199	2.23	2.57	A.
November	460	141	219	2.45	2.73	A.
December	430	99	173	1.94	2.24	A.

HUDSON RIVER BASIN.

COMPARATIVE DISCHARGE OF STREAMS IN THE HUDSON RIVER BASIN.

A comparison of discharge of streams in Hudson River basin, containing two tables for the years 1904 to 1911, inclusive, appears on pages 117–122 of Water-Supply Paper 301, and is continued on page 131 of Water-Supply Paper 321 and in the following tables:

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Comparison (by monthly means) of discharge in the Hudson River basin for 1913.

	Hudson, North Creek.	Schroon, Riverbank.	North Creek + Riverbank.	Hudson, Thurman.	Sacandaga.		Thurman + Hadley.	Hudson.	
					Hope.	Hadley.		Spier Falls.	Mechanicville + Champlain Canal.
Drainage area (square miles)	804	534	1,340	1,550	.....	1,060	2,610	2,800	4,500
January	2,370	1,080	3,450	3,790	2,260	4,260	8,050	8,570	12,700
February	1,020	592	1,612	1,770	592	1,130	2,900	2,910	5,220
March	5,340	2,450	7,790	8,570	4,350	7,770	16,340	21,000	25,300
April	3,810	2,480	6,290	7,390	2,080	4,270	11,660	12,900	16,300
May	1,540	931	2,471	3,220	1,340	2,200	5,420	5,290	7,210
June	874	795	1,669	2,000	603	1,220	3,220	3,260	4,230
July	621	181	802	1,040	138	228	1,268	1,080	1,970
August	508	101	609	666	74	137	803	813	1,260
September	444	71	516	622	96	182	804	776	1,380
October	720	172	892	1,230	581	959	2,189	1,950	2,910
November	1,640	360	2,000	2,440	1,480	2,570	5,010	5,080	6,470
December	642	432	1,074	1,440	737	1,360	2,800	2,900	4,840

Comparison (by monthly ratios) of discharge in the Hudson River basin for 1913.

	Ratio of North Creek + Riverbank to Thurman.	Ratio of Thurman + Hadley to Spier Falls.	Ratio of Thurman + Hadley to Mechanicville.	Ratio of Spier Falls to Mechanicville.
Drainage area ratio	0.86	0.93	0.58	0.62
January	.91	.94	.63	.67
February	.91	1.00	.56	.56
March	.91	.78	.65	.83
April	.85	.90	.72	.79
May	.77	1.02	.75	.73
June	.83	.99	.76	.77
July	.77	1.17	.64	.55
August	.91	.99	.64	.65
September	.83	1.04	.58	.56
October	.73	1.12	.75	.67
November	.82	.99	.77	.79
December	.75	.97	.58	.60

HUDSON RIVER AT NORTH CREEK, N. Y.

Location.—At the highway bridge in the village of North Creek, immediately above the mouth of North Creek, which enters the Hudson from the right.

Records available.—September 21, 1907, to December 31, 1913. Data also in annual reports of the State engineer and surveyor, and the State of New York Conservation Commission.

Drainage area.—804 square miles.

Gage.—Chain on highway bridge.

Channel and control.—Heavy gravel; practically permanent.

Discharge measurements.—Made from the two-span steel highway bridge.

Regulation.—Natural flow affected by the operation of storage in Indian Lake and other reservoirs in upper Hudson River basin in connection with log driving.

Winter flow.—Sometimes seriously affected by ice.

Floods.—The crest of the flood of March 25 to 30, 1913, reached a gage height of about 12 feet in the evening of March 27, as indicated by observations of the gage reader and later verified from high-water marks by engineers of the Geological Survey. The corresponding discharge was approximately 30,000 second-feet, or 37.3 second-feet per square mile of drainage area.

Accuracy.—Results good.

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Discharge measurements of Hudson River at North Creek, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 3	Frank Weber	3.01	877	Sept. 22	C. S. De Golyer	2.96	761
Apr. 14	C. S. De Golyer	5.11	4,390	23	do	3.00	775
Sept. 19	do	2.73	535	Dec. 31	do	a2.78	479

a Measurement made under partial ice cover with slush ice running.

Daily gage height, in feet, of Hudson River at North Creek, N. Y., for 1913.

[Gilbert Dean, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.85	3.7	3.0	7.0	3.35	4.3	2.95	3.2	2.55	2.5	3.5	2.8
2	2.8	3.5	3.05	6.1	4.3	4.0	2.8	3.05	2.55	2.65	3.5	2.75
3	2.95	3.4	3.0	5.6	3.25	3.8	2.55	2.8	2.55	2.9	3.05	2.8
4	3.5	3.35	3.0	5.9	4.2	3.65	2.65	2.65	2.55	3.0	2.7	2.85
5	3.75	3.2	3.05	7.4	3.1	3.45	2.65	2.75	2.55	2.95	2.6	2.9
6	3.8	3.1	3.0	6.7	3.7	3.3	2.8	2.75	2.55	2.9	2.55	2.8
7	3.95	3.0	3.15	5.8	3.0	3.2	2.6	2.75	2.5	2.8	2.55	2.8
8	4.1	3.0	3.3	5.2	4.4	3.15	2.6	2.7	2.5	2.75	2.46	2.8
9	4.2	3.0	3.3	4.9	3.55	3.1	2.6	2.7	2.5	2.7	3.4	3.05
10	4.1	2.9	3.4	4.0	3.2	3.1	2.85	2.7	2.5	2.7	6.0	3.3
11	3.85	3.15	3.1	4.7	3.0	3.0	2.95	2.7	2.6	2.7	5.6	3.1
12	3.8	3.3	2.85	4.3	2.9	2.75	2.95	2.7	2.75	2.7	5.3	2.95
13	3.85	3.3	2.7	4.8	2.9	2.8	2.9	2.65	2.65	2.7	4.3	3.0
14	3.9	3.3	3.4	4.6	3.2	2.7	2.9	2.65	2.5	2.7	3.9	2.9
15	3.75	3.3	4.7	4.4	3.0	2.65	2.9	2.65	2.7	2.65	3.7	2.9
16	3.6	3.4	5.3	4.8	3.1	2.65	2.9	2.6	2.65	2.6	3.5	2.9
17	3.55	3.3	4.8	4.7	3.1	2.6	2.9	2.65	2.75	2.6	3.3	2.8
18	3.95	3.25	4.6	5.0	3.1	2.8	2.85	2.6	2.7	2.6	3.15	2.8
19	4.8	3.2	4.5	4.3	3.05	2.9	2.85	2.6	2.75	2.55	3.0	2.65
20	4.9	3.2	4.6	3.8	3.05	2.9	2.85	2.6	2.75	2.75	3.3	2.65
21	5.2	3.15	5.3	4.0	3.0	2.9	2.8	2.6	2.75	3.25	4.2	2.9
22	5.2	3.2	6.2	3.85	3.65	2.85	2.8	2.6	2.95	3.45	4.1	3.15
23	5.0	3.25	5.8	3.5	4.0	2.8	2.8	2.6	3.05	3.4	3.8	3.15
24	4.7	3.25	5.6	3.9	3.7	2.8	2.8	2.6	2.8	3.25	3.55	2.95
25	4.6	3.3	7.4	3.55	3.75	2.75	2.8	2.6	2.75	3.0	3.4	2.65
26	4.5	3.2	9.6	4.1	3.7	2.75	2.8	2.55	2.5	3.05	3.45	2.6
27	4.3	3.05	10.8	3.75	3.4	2.7	2.75	2.6	2.96	3.45	3.15	2.55
28	4.1	3.05	10.4	3.85	3.65	2.7	2.8	2.55	2.19	3.35	3.05	2.38
29	3.9	.....	8.4	3.55	4.7	2.7	2.9	2.6	2.12	3.15	2.85	2.6
30	3.8	.....	7.3	4.6	4.9	2.85	2.95	2.55	2.24	3.1	2.95	2.75
31	3.5	.....	6.9	.....	4.7	.....	3.15	2.55	.....	3.05	.....	2.75

NOTE.—Discharge relation Feb. 11-28, and Dec. 29-31 affected by ice.

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Daily discharge, in second-feet, of Hudson River at North Creek, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	745	1,770	890	9,200	1,180	2,720	732	1,000	418	385	1,390	600
2	700	1,480	940	6,690	2,720	2,180	600	832	418	485	1,390	560
3	840	1,350	890	5,440	1,060	1,840	418	600	418	685	832	600
4	1,480	1,280	890	6,180	2,540	1,600	485	485	418	780	520	642
5	1,840	1,100	940	10,400	885	1,320	485	560	418	732	450	685
6	1,920	990	890	8,330	1,680	1,120	600	560	418	685	418	600
7	2,160	890	1,040	5,930	780	1,000	450	560	385	600	418	600
8	2,400	890	1,220	4,520	2,910	942	450	520	385	560	361	780
9	2,570	890	1,220	3,880	1,460	885	450	520	385	520	1,250	832
10	2,400	790	1,350	2,180	1,000	885	642	520	385	520	6,430	1,120
11	2,000	1,000	990	3,480	780	780	732	520	450	520	5,440	885
12	1,920	1,000	745	2,720	685	560	732	520	560	520	4,740	732
13	2,000	1,000	610	3,680	685	600	685	485	485	520	2,720	780
14	2,080	990	1,350	3,290	1,000	520	685	485	385	520	2,010	685
15	1,840	970	3,480	2,910	780	485	685	485	520	485	1,680	685
16	1,620	950	4,740	3,680	885	485	685	450	485	450	1,390	685
17	1,550	940	3,680	3,480	885	450	685	485	560	450	1,120	600
18	2,160	900	3,290	4,090	885	600	642	450	520	450	942	600
19	3,680	880	3,100	2,720	832	685	642	450	560	418	780	485
20	3,880	880	3,290	1,840	832	685	642	450	560	560	1,120	485
21	4,520	880	4,740	2,180	780	685	600	450	560	1,060	2,540	685
22	4,520	890	6,950	1,920	1,600	642	600	450	732	1,320	2,360	942
23	4,090	980	5,930	1,390	2,180	600	600	450	832	1,250	1,840	942
24	3,480	1,140	5,440	2,010	1,680	600	600	450	600	1,060	1,460	732
25	3,290	970	10,400	1,460	1,760	560	600	450	560	780	1,250	485
26	3,100	900	18,200	2,360	1,680	560	600	418	385	832	1,320	450
27	2,740	900	23,900	1,760	1,250	520	560	450	303	1,320	942	418
28	2,400	890	21,900	1,920	1,600	520	600	418	221	1,180	832	314
29	2,080	.....	13,600	1,460	3,480	520	685	450	193	942	642	361
30	1,920	.....	10,100	3,290	3,880	642	732	418	243	885	732	457
31	1,480	.....	8,910	.....	3,480	.....	942	418	.....	832	.....	479

NOTE.—Discharge determined from a well-defined rating curve. Estimate Feb. 11–28 determined by comparison with records at Indian Lake and Spier Falls. Discharge Dec. 29–31 estimated on the basis of discharge measurement of Dec. 31.

Monthly discharge of Hudson River at North Creek, N. Y., for 1913.

[Drainage area, 804 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	4,520	700	2,370	2.95	3.40	A.
February	1,770	790	1,020	1.27	1.32	B.
March	23,900	610	5,340	6.64	7.66	A.
April	10,400	1,390	3,810	4.74	5.29	A.
May	3,880	685	1,540	1.92	2.21	A.
June	2,720	450	874	1.09	1.22	A.
July	942	418	621	.770	.89	B.
August	1,000	418	508	.632	.73	B.
September	832	193	444	.552	.62	B.
October	1,320	385	720	.896	1.03	A.
November	6,430	361	1,640	2.04	2.28	A.
December	1,120	314	642	.799	.92	B.
The year	23,900	193	1,630	2.03	27.57	

HUDSON RIVER AT THURMAN, N. Y.

Location.—At the Delaware & Hudson Railroad bridge leading from Thurman to Warrensburg, about 950 feet below the highway bridge to Warrensburg, about 2,000 feet below Schroon River, and about 13 miles above Sacandaga River, which enters from the right.

Records available.—September 1, 1907, to December 31, 1913; also in annual reports of the State engineer and surveyor, and the State of New York Conservation Commission.

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Drainage area.—1,550 square miles.

Gage.—Chain gage on railroad bridge.

Channel and control.—Sand and gravel; liable to shift; occasionally accumulations of logs at the control and around the bridge piers.

Discharge measurements.—Made from the bridge.

Regulation.—Flow affected by storage at Indian Lake and by operation of mills on Schroon River.

Winter flow.—Station discontinued during the winter months because of ice. Winter flow estimated from the determinations of combined flow at Riverbank and North Creek plus an estimated inflow between the two stations.

Floods.—The flood of March 25 to 30, 1913, reached a maximum gage height of 12.5 feet as determined from high-water marks by engineers of the Geological Survey. The corresponding discharge was approximately 46,000 second-feet, or 29.7 second-feet per square mile of drainage area.

Accuracy.—Results fair.

Cooperation.—Gage heights, January, February, March, and December furnished by Albany office of United States Weather Bureau.

Discharge measurements of Hudson River at Thurman, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 11	C. S. De Golyer	4.90	5,970	Aug. 5	C. S. De Golyer	2.50	662
21	do	4.22	4,220	6	do	2.52	623
May 27	do	3.81	3,000	Oct. 3	G. H. Canfield	2.68	860

Daily gage height, in feet, of Hudson River at Thurman, N. Y., for 1913.

[S. H. Spencer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.8	6.4	.....	3.85	4.6	3.05	2.94	2.41	2.42	3.1	2.9
2	2.9	10.7	6.4	.....	4.8	4.4	3.0	2.88	2.38	2.58	3.3	3.1
3	3.3	10.9	6.7	.....	3.75	4.2	2.82	2.71	2.34	2.74	3.1	3.0
4	3.7	10.3	6.7	6.2	4.7	4.0	2.65	2.58	2.35	2.86	2.92	3.0
5	3.8	9.9	6.5	7.3	3.5	3.9	2.87	2.57	2.33	2.84	2.63	3.0
6	3.8	9.7	6.8	6.8	4.4	3.8	2.71	2.55	2.33	2.84	2.82	3.1
7	3.9	8.8	6.8	6.4	3.45	3.7	2.82	2.54	2.33	2.74	2.80	3.2
8	4.0	8.7	6.8	5.8	4.8	3.4	2.72	2.50	2.37	2.66	2.70	3.4
9	10.0	8.3	7.1	5.6	3.85	3.45	2.69	2.46	2.38	2.61	2.52	3.4
10	10.3	7.7	7.9	4.9	3.4	3.4	2.70	2.58	2.35	2.60	5.6	3.4
11	9.9	7.6	7.5	5.4	3.35	3.35	2.85	2.54	2.38	2.54	5.1	3.4
12	10.0	7.5	6.6	4.7	3.3	3.05	2.82	2.52	2.50	2.60	4.5	3.1
13	9.0	7.3	6.3	5.2	3.2	2.90	2.76	2.51	2.46	2.58	4.1	3.3
14	9.0	7.3	9.5	4.7	3.35	2.92	2.88	2.54	2.35	2.54	3.8	3.3
15	7.2	7.5	9.5	5.2	3.3	2.82	2.81	2.50	2.54	2.54	3.65	3.2
16	7.0	7.4	9.3	4.8	3.3	2.85	2.81	2.47	2.44	2.54	3.35	3.1
17	6.8	7.4	8.4	5.1	3.35	2.82	2.80	2.47	2.48	2.51	3.2	3.1
18	6.3	7.4	8.4	4.6	3.2	2.82	2.88	2.50	2.52	2.54	3.3	3.1
19	6.4	7.0	6.7	4.9	3.25	3.15	2.88	2.44	2.58	2.48	3.1	3.0
20	6.0	6.9	6.5	4.2	3.2	3.15	2.62	2.42	2.65	2.88	3.3	2.9
21	5.7	7.3	6.6	4.2	3.15	3.1	2.88	2.43	2.49	3.2	3.8	3.0
22	5.6	6.8	6.3	4.5	3.2	2.88	2.78	2.40	2.96	3.25	3.95	3.2
23	5.3	6.9	5.9	3.9	4.1	3.05	2.82	2.41	3.05	3.35	3.75	2.9
24	5.0	6.4	5.5	4.5	3.85	3.0	2.81	2.36	2.71	3.25	3.6	3.2
25	4.7	6.4	8.9	4.4	3.9	3.05	2.69	2.40	2.63	3.1	3.5	2.7
26	4.6	6.3	9.9	4.5	4.0	2.94	2.68	2.42	2.50	3.55	3.35	3.3
27	4.4	6.5	10.9	4.1	3.85	3.0	2.54	2.44	2.30	3.5	3.3	3.8
28	4.1	6.7	.....	5.6	3.85	2.90	2.85	2.41	2.28	3.45	3.2	4.0
29	4.2	.....	.....	3.95	4.9	2.63	2.78	2.44	2.18	3.4	3.15	4.2
30	4.8	.....	.....	4.4	5.0	2.94	2.73	2.40	2.12	3.25	3.0	4.3
31	5.4	.....	.....	.....	4.9	.....	2.88	2.34	.....	3.15	.....	4.5

NOTE.—Discharge relation Jan. 1 to Mar. 27 and Dec. 26-31 seriously affected by ice.

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Daily discharge, in second-feet, of Hudson River at Thurman, N. Y., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	16,000	3,200	5,290	1,460	1,270	551	562	1,550	1,200
2	12,600	5,870	4,710	1,370	1,170	520	746	1,940	1,550
3	10,600	2,960	4,140	1,070	914	480	956	1,550	1,370
4	10,600	5,580	3,590	835	746	490	1,140	1,230	1,370
5	14,900	2,370	3,330	1,150	734	470	1,100	809	1,370
6	12,900	4,710	3,080	914	710	470	1,100	1,070	1,370
7	11,400	2,260	2,840	1,070	698	470	956	1,040	1,550
8	9,140	5,870	2,150	928	650	510	848	900	1,740
9	8,440	3,200	2,260	887	606	520	783	674	2,150
10	6,170	2,150	2,150	900	746	490	770	8,440	2,150
11	7,760	2,040	2,040	1,120	698	520	698	6,780	2,150
12	5,580	1,940	1,460	1,070	674	650	770	5,000	1,550
13	7,100	1,740	1,200	984	662	606	746	3,860	1,940
14	5,580	2,040	1,280	1,170	698	490	698	3,080	1,940
15	7,100	1,940	1,070	1,060	650	698	698	2,720	1,740
16	5,870	1,940	1,120	1,060	617	584	698	2,040	1,550
17	6,780	2,040	1,070	1,040	617	628	662	1,940	1,550
18	5,290	1,740	1,070	1,170	650	674	698	1,940	1,550
19	6,170	1,840	1,640	1,170	584	746	628	1,550	1,370
20	4,140	1,740	1,640	796	562	835	1,170	1,940	1,200
21	4,140	1,640	1,550	1,170	573	639	1,740	3,080	1,370
22	5,000	1,740	1,170	1,010	540	1,300	1,840	3,460	1,740
23	3,330	3,860	1,460	1,070	551	1,460	2,040	2,960	1,200
24	5,000	3,200	1,370	1,060	500	914	1,840	2,600	1,740
25	4,710	3,330	1,460	887	540	809	1,550	2,370	900
26	5,000	3,590	1,270	874	562	650	2,480	2,040	970
27	3,860	3,200	1,370	698	584	440	2,370	1,940	910
28	8,440	3,200	1,200	1,120	551	422	2,260	1,740	770
29	3,460	6,170	809	1,010	584	335	2,150	1,640	830
30	4,710	6,470	1,270	942	540	290	1,840	1,370	930
31	.....	6,170	.....	1,170	480	.....	1,640	.....	930

NOTE.—Discharge determined from a fairly well defined rating curve. Daily discharge Apr. 1–3 and Dec. 29–31, and mean discharge for January, February, and March computed from the combined flow at North Creek and Riverbank plus an estimated inflow for drainage between these points and Thurman.

Monthly discharge of Hudson River at Thurman, N. Y., for 1913.

[Drainage area, 1,550 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	.....	.....	3,790	2.45	2.83	B.
February	.....	.....	1,770	1.14	1.19	C.
March	.....	.....	8,570	5.53	6.38	B.
April	16,000	3,330	7,390	4.77	5.32	B.
May	6,470	1,640	3,220	2.08	2.40	A.
June	5,290	809	2,000	1.29	1.44	A.
July	1,460	698	1,040	.671	.77	A.
August	1,270	480	666	.430	.50	B.
September	1,460	290	622	.401	.45	B.
October	2,480	562	1,230	.794	.92	A.
November	8,440	674	2,440	1.57	1.75	A.
December	.....	.....	1,440	.929	1.07	B.
The year	.....	.....	2,850	1.84	25.02	

HUDSON RIVER AT SPIER FALLS, N. Y.

Location.—On the river road half a mile below the Spier Falls Dam, about 11½ miles below Sacandaga River. This station is most easily reached from Glens Falls, N. Y., a distance of 11 miles.

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Records available.—October 7, 1912, to December 31, 1913.
Drainage area.—2,800 square miles.
Gage.—Gurley Simplex automatic gage referred to an inclined staff.
Channel and control.—Coarse gravel and bowlders.
Discharge measurements.—Made from a cable about 1,000 feet below the gage.
Winter flow.—Occasionally affected by ice.
Regulation.—Flow affected by operation of the Spier Falls Dam, resulting in low Sunday discharges.
Floods.—The flood of March 25 to 30, 1913, reached a crest elevation of 18.59 feet gage height at 12.25 a. m. March 28 as shown by the automatic gage records. The corresponding discharge was 89,100 second-feet, or 31.8 second-feet per square mile of drainage area.
Accuracy.—Results good.

Discharge measurements of Hudson River at Spier Falls, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 5	J. G. Mathers	3.60	2,770	Aug. 12	G. J. Lyon	3.03	1,700
6	do	3.99	3,470	14	do	3.11	1,880
19	C. S. De Golyer	7.26	12,600	16	do	2.24	789
19	do	7.16	12,700	17	do	.84	198
21	do	8.01	16,000	17	do	1.58	413
22	do	9.38	22,300	17	do	.72	85.6
29	J. G. Mathers	16.46	69,000	17	do	.72	87.6
Apr. 9	C. S. De Golyer	8.16	16,400	18	do	2.74	1,320
June 28	do	3.18	2,120	31	do	.78	99.4
Aug. 2	O. W. Hartwell	3.65	3,020				

Daily discharge, in second-feet, of Hudson River at Spier Falls, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,240	5,880	2,980	33,800	7,650	11,100	1,560	1,350	638	792	3,350	3,210
2	4,090	4,420	2,050	27,700	7,890	9,310	1,460	1,750	1,220	755	2,880	2,610
3	4,220	3,880	2,700	22,700	5,660	7,750	1,480	972	1,070	957	3,220	2,800
4	8,100	3,900	2,260	19,800	5,670	6,510	1,340	1,320	822	1,260	2,420	2,570
5	7,640	3,760	2,280	23,200	4,560	5,480	1,240	1,280	738	906	2,510	2,660
6	7,890	3,160	2,330	24,200	5,100	4,720	820	1,160	640	1,760	2,420	2,940
7	8,210	2,930	2,130	20,500	4,400	4,250	1,620	1,090	156	1,390	2,070	2,550
8	8,670	3,190	2,020	16,900	5,400	3,500	1,420	1,140	748	1,160	1,750	5,100
9	8,410	2,720	1,740	15,400	5,010	3,310	1,310	899	748	1,320	1,560	5,670
10	8,350	2,760	3,440	11,400	3,680	3,190	1,260	383	785	1,230	13,300	5,080
11	8,210	2,680	4,550	10,600	3,130	3,120	1,200	1,030	837	1,050	16,000	4,880
12	8,150	2,390	4,030	11,300	2,790	2,490	1,340	1,090	817	442	13,700	3,380
13	7,240	2,590	14,270	11,100	3,010	2,390	610	1,130	695	1,230	11,100	3,250
14	6,810	2,360	9,370	10,900	3,200	2,060	1,330	1,110	151	1,230	8,780	3,080
15	6,630	2,350	13,500	11,400	3,380	1,730	1,500	1,180	783	1,240	7,070	3,655
16	6,350	2,090	16,800	9,460	3,000	2,000	1,520	892	800	1,240	5,610	3,220
17	6,390	2,810	15,600	10,600	3,030	1,930	1,350	358	755	1,190	.....	3,160
18	8,010	2,680	14,200	9,100	2,880	2,050	1,600	899	775	1,240	.....	3,160
19	11,200	2,270	13,100	8,880	2,770	2,050	1,140	942	912	401	3,360	2,990
20	12,200	2,120	14,000	8,660	2,660	2,150	579	790	946	1,550	3,450	2,530
21	14,300	2,460	16,400	8,000	2,920	1,890	1,250	870	569	2,180	4,820	1,600
22	14,500	2,310	22,000	8,000	2,720	1,310	1,320	978	1,490	3,300	6,080	2,690
23	13,800	3,330	22,000	7,000	4,770	2,150	1,270	812	1,930	3,580	5,440	2,810
24	13,300	3,360	35,500	6,170	7,060	1,990	1,280	196	2,510	3,210	5,080	2,980
25	12,000	3,070	49,000	6,630	7,740	2,060	1,280	865	1,630	3,000	4,230	2,540
26	10,800	2,890	62,400	6,600	7,370	2,040	1,020	933	1,460	4,080	3,820	2,380
27	9,820	2,720	76,200	6,060	6,520	2,120	571	1,060	1,020	5,370	3,540	2,080
28	8,190	2,440	84,200	7,410	6,770	1,880	1,280	1,170	301	5,200	3,220	831
29	6,770	.....	67,000	7,100	11,700	1,250	1,590	1,100	1,160	4,580	3,040	1,980
30	5,960	.....	48,900	7,480	14,100	2,170	1,150	1,070	1,060	4,070	2,220	1,620
31	5,490	.....	36,600	.....	13,200	.....	1,130	425	.....	3,600	.....	2,650

NOTE.—Discharge determined from a well-defined rating curve by taking the average of 24 hourly discharges for each day.

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Monthly discharge of Hudson River at Spier Falls, N. Y., for 1913.

[Drainage area, 2,800 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	14,500	4,090	8,580	3.06	3.53	A.
February	5,880	2,090	2,980	1.06	1.10	A.
March	84,200	2,020	21,100	7.54	8.69	A.
April	33,800	a 6,060	12,900	4.61	5.14	A.
May	14,100	2,660	5,480	1.96	2.26	A.
June	11,100	a 1,250	3,330	1.19	1.33	A.
July	1,620	a 571	1,250	.446	.51	A.
August	1,750	a 196	976	.349	.40	A.
September	2,510	a 151	939	.335	.37	A.
October	5,370	a 401	2,080	.743	.86	A.
November	16,000	a 1,560	5,150	1.84	2.05	A.
December	5,670	a 831	2,990	1.07	1.23	A.
The year	84,200	151	5,670	2.02	27.47	

a Sunday.

HUDSON RIVER AT MECHANICSVILLE, N. Y.

Location.—At the Duncan dam of the West Virginia Pulp & Paper Co., in the village of Mechanicsville, about 3,700 feet above the mouth of Anthony Kill (coming in from the right), 1¼ miles below the mouth of Hoosic River (coming in from the left), and about 19 miles above the mouth of Mohawk River, which enters from the right at Cohoes.

Records available.—1888 to 1913. Data also in annual reports of the State engineer and surveyor, and the State of New York Conservation Commission.

Drainage area.—4,500 square miles.

Gage.—Recording gage referred to a vertical staff showing depth of water over crest of dam.

Computation of discharge.—Discharge determined from a rating curve based on United States Geological Survey coefficients for dams of ogee section. Prior to the summer of 1910 discharge determined from two daily gage readings on the crest of the dam and continuous record of the run of the wheels in the adjoining paper mill.

Diversions.—Water diverted above this station for the Champlain Canal. No correction made for this diversion.

Regulation.—Flow affected by operation of dams above the station, often resulting in low Sunday discharges.

Floods.—The river was at flood stage from March 25 to April 3, 1913, reaching its crest height at 6 a. m March 28 with a maximum discharge of approximately 118,000 second-feet, or 26.2 second-feet per square mile of drainage area. The mean discharge for the day of March 28 was 113,500 second-feet, or 25.2 second-feet per square mile.

Accuracy.—Results good.

Cooperation.—Records computed and furnished by Mr. R. P. Bloss, engineer of the West Virginia Pulp & Paper Co.

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Daily discharge, in second-feet, of Hudson River at Mechanicsville, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10,481	6,098	7,027	39,274	10,072	9,885	2,999	1,332	536	1,143	5,005	5,607
2	6,687	8,382	4,487	32,861	7,921	9,974	2,111	1,347	1,906	1,511	2,470	4,101
3	12,154	6,868	6,653	22,765	8,745	7,722	1,821	803	948	1,259	5,138	4,254
4	15,178	6,233	6,712	23,679	7,384	7,100	6,221	1,462	981	998	4,487	3,968
5	11,968	6,356	4,722	23,437	9,330	5,871	586	1,800	949	750	3,224	4,564
6	14,259	6,321	4,090	25,833	5,654	4,289	516	1,316	1,184	1,442	3,559	4,568
7	14,197	5,414	5,078	24,789	12,144	4,695	2,826	1,543	1,850	1,438	3,693	1,479
8	16,567	4,404	2,992	21,300	4,980	1,427	1,821	1,420	1,257	1,820	3,279	8,240
9	15,269	6,740	2,954	17,082	7,105	4,868	1,842	1,191	1,267	1,174	1,433	7,194
10	14,012	4,782	7,642	15,781	5,906	4,138	2,091	478	1,970	1,192	10,169	7,534
11	13,453	5,131	8,211	13,761	3,938	4,021	1,737	1,239	725	1,043	19,215	7,200
12	13,669	4,782	9,026	9,092	7,312	3,226	1,706	1,006	969	980	16,085	6,431
13	11,574	3,508	7,983	16,064	4,081	3,894	1,000	995	894	1,689	13,419	4,665
14	10,308	3,493	9,796	19,871	3,895	2,613	1,588	1,012	502	1,257	11,964	4,706
15	10,399	3,815	24,859	14,542	4,097	.....	1,833	1,016	1,247	1,271	9,445	7,358
16	10,038	5,336	22,755	14,508	3,848	3,450	1,699	1,081	735	1,296	3,106	5,544
17	10,330	4,165	22,916	12,694	3,700	2,548	2,445	574	735	1,315	7,871	4,778
18	13,039	4,670	18,007	12,946	4,990	8,554	1,158	1,369	725	1,283	6,617	5,517
19	12,786	4,525	17,041	16,176	3,185	2,542	1,667	1,096	912	560	5,847	5,614
20	14,303	4,407	17,415	13,022	3,862	2,844	924	1,018	170	1,647	4,896	4,429
21	16,775	4,381	20,934	14,806	3,862	3,165	1,640	801	1,323	1,469	5,768	4,251
22	17,221	4,478	23,240	13,301	3,877	861	1,514	1,284	1,145	2,140	1,195	5,143
23	14,857	833	27,300	15,097	9,660	3,571	1,484	1,060	1,265	4,447	4,434	3,892
24	15,511	7,675	25,059	8,788	9,314	2,448	1,808	213	2,736	3,756	7,470	4,805
25	14,473	6,051	23,404	8,869	9,756	2,478	1,772	1,146	2,316	3,783	6,034	4,132
26	11,327	5,459	46,591	7,868	9,351	2,138	2,193	995	1,632	4,309	5,404	3,990
27	13,317	5,778	77,862	5,357	4,318	2,353	414	1,027	992	10,553	5,263	4,780
28	12,351	6,126	113,510	6,912	12,421	3,063	2,285	1,007	1,653	9,203	5,147	2,005
29	10,294	.....	112,918	10,075	12,956	1,532	1,191	964	945	7,024	3,241	3,025
30	8,407	.....	60,269	7,428	12,796	1,866	1,250	960	.....	6,738	3,463	4,349
31	9,208	.....	42,484	.....	.....	.....	1,115	686	.....	5,753	.....	2,364

Monthly discharge of Hudson River at Mechanicsville, N. Y., for 1913.

[Drainage area, 4,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	17,200	6,690	12,700	2.82	3.25
February	8,380	a 833	5,220	1.16	1.21
March	114,000	a 2,950	25,300	5.62	6.48
April	39,300	a 5,360	16,300	3.62	4.04
May	13,000	3,180	7,020	1.56	1.80
June	9,970	a 861	4,040	.898	1.00
July	6,220	a 414	1,780	.396	.46
August	1,800	a 213	1,070	.238	.27
September	2,740	170	1,190	.264	.29
October	10,600	a 560	2,720	.604	.70
November	19,200	1,200	6,280	1.40	1.55
December	8,240	a 1,490	4,840	1.08	1.24
The year	114,000	170	7,420	1.65	22.29

a Sunday.

CEDAR RIVER NEAR INDIAN LAKE, N. Y.

Location.—At the steel highway bridge on the road leading to Blue Mountain Lake about 2 miles west of Indian Lake village, 8 miles by river above Rock River, 10 miles by river below Wakely dam, and about 12 miles by river above the mouth.

Records available.—July 15, 1911, to December 31, 1913. Data published also in the annual reports of the State of New York Conservation Commission.

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Drainage area.—85 square miles.

Gage.—Chain on highway bridge read once daily.

Channel.—Coarse gravel and small bowlders; practically permanent.

Discharge measurements.—Made from the bridge, or by wading.

Regulation.—Flow affected by storage in Cedar Lake and Cedar River Flow. Storage in Cedar River Flow used principally during the logging season.

Winter flow.—Seriously affected by ice.

Floods.—The high water of March 25 to 30, 1913, reached a stage of 13 feet, as indicated by shore drift, but this maximum height was probably due, in part, to backwater from ice jams. A recorded gage height of 9.8 feet on March 28 probably indicates very nearly the maximum unobstructed stage of the river, the discharge at this stage being 2,490 second-feet, or 29.3 second-feet per square mile of drainage area.

Accuracy.—Results good for open-water season.

Discharge measurements of Cedar River near Indian Lake, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 22	R. S. Barnes	[a] 5.93	120	Apr. 16	C. S. DeGolyer	4.00	241
Apr. 16	C. S. De Golyer	7.95	1,640	July 7	.....do	2.61	35.5
16	.....do	6.41	902	Sept. 10	.....do	2.50	20.4
16	.....do	4.39	334	17	.....do	2.50	18.9

[a] Measurement made under complete ice cover.

Daily gage height, in feet, of Cedar River near Indian Lake, N. Y., for 1913.

[Chauncy Hill, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.1	3.25	4.1	2.5	2.6	2.6	2.6	6.9	3.5
2	.....	4.0	3.1	4.0	2.5	2.6	2.55	2.7	5.3	3.3
3	.....	3.9	3.05	3.7	2.5	2.65	2.6	3.4	3.8	3.6
4	.....	5.0	3.0	3.7	2.4	2.75	2.7	3.2	3.35	3.5
5	.....	9.7	3.0	3.2	2.4	2.7	2.5	2.8	3.4	3.4
6	.....	4.7	2.95	3.25	2.4	2.7	2.45	2.75	3.3	3.4
7	.....	4.0	2.9	3.3	2.6	2.65	2.4	2.7	3.3	3.4
8	.....	9.8	2.9	3.1	2.65	2.6	2.5	2.7	3.4	3.6
9	.....	4.7	3.0	3.65	2.7	2.6	2.5	2.75	5.7	5.6
10	.....	3.3	3.1	3.6	3.1	2.6	2.5	2.8	8.7	5.6
11	.....	3.65	2.9	3.45	2.9	2.6	2.5	2.6	8.5	6.1
12	.....	3.8	3.0	3.3	2.7	2.6	2.5	2.8	8.0	6.5
13	.....	3.85	4.6	2.95	2.75	2.6	2.55	2.85	7.0	6.4
14	.....	9.6	3.2	2.9	2.7	2.6	2.6	2.8	4.0	6.3
15	.....	3.9	4.0	2.8	2.7	2.6	2.55	2.8	3.9	5.5
16	.....	8.2	3.3	2.75	2.6	2.5	2.5	2.7	3.7	5.5
17	.....	3.35	3.35	2.8	2.65	2.45	2.55	2.7	3.5	5.4
18	.....	3.3	3.15	2.75	2.6	2.4	2.6	2.75	3.45	5.4
19	.....	3.4	3.2	2.8	2.7	2.6	2.6	2.7	3.5	5.0
20	.....	3.45	3.2	3.0	2.6	2.6	2.55	3.6	5.3	5.1
21	.....	3.2	3.0	2.9	2.7	2.6	2.6	5.9	4.8	.....
22	.....	3.2	9.6	2.85	2.6	2.6	3.95	4.5	4.3	.....
23	.....	3.15	4.5	2.75	2.6	2.7	3.8	4.0	4.4	.....
24	.....	3.1	4.4	2.7	2.7	2.65	3.7	3.95	4.5	.....
25	.....	3.5	6.0	2.55	2.75	2.6	3.6	4.0	5.5	.....
26	11.3	3.35	4.0	2.5	2.7	2.6	3.6	4.2	3.6	.....
27	10.8	3.2	3.15	2.6	2.65	2.6	2.7	4.2	3.4	.....
28	9.8	3.25	4.0	2.55	2.7	2.6	2.7	4.4	3.35	.....
29	4.4	3.7	5.6	2.4	2.9	2.7	2.65	4.0	3.4	.....
30	4.05	3.35	5.3	2.5	2.7	2.6	2.6	4.3	3.3	.....
31	4.2	.....	4.9	.....	2.65	2.6	.....	4.4	.....	.....

NOTE.—Discharge relation affected by ice Jan. 1 to Mar. 27, and Dec. 9–31.

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Daily discharge, in second-feet, of Cedar River near Indian Lake, N. Y., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	532	100	266	29	35	26	26	1,170	128
2	.....	243	80	243	29	35	23	33	570	98
3	.....	221	74	179	29	38	26	112	184	146
4	.....	502	69	179	23	46	33	84	105	128
5	.....	2,450	69	93	23	42	20	41	112	112
6	.....	417	64	100	23	42	18	37	98	112
7	.....	243	59	107	35	38	15	33	98	112
8	.....	2,490	59	80	38	35	20	33	112	146
9	.....	417	69	169	42	35	20	37	702	.....
10	.....	107	80	159	80	35	20	41	1,970	.....
11	.....	169	59	132	59	35	20	26	1,870	.....
12	.....	200	69	107	42	35	20	41	1,640	.....
13	.....	210	390	64	46	35	23	46	1,210	.....
14	.....	2,400	93	59	42	35	26	41	226	.....
15	.....	221	243	50	42	35	23	41	204	.....
16	.....	1,760	107	46	35	29	20	33	164	.....
17	.....	115	115	50	38	26	23	33	128	.....
18	.....	107	86	46	35	23	26	37	120	.....
19	.....	123	93	50	42	26	26	33	128	.....
20	.....	132	93	69	35	26	23	146	570	.....
21	.....	93	69	59	42	26	26	774	422	.....
22	.....	93	2,400	54	35	26	215	344	296	.....
23	.....	86	364	46	35	33	184	226	320	.....
24	.....	80	338	42	42	30	164	215	344	.....
25	.....	140	842	32	46	26	146	226	634	.....
26	.....	115	243	29	42	26	146	272	146	.....
27	.....	93	86	35	38	26	33	272	112	.....
28	2,490	100	243	32	42	26	33	320	105	.....
29	338	179	696	23	59	33	30	226	112	.....
30	254	115	595	29	42	26	26	296	98	.....
31	289	.....	473	.....	38	26	.....	320	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. No estimates of discharge during frozen season.

Monthly discharge of Cedar River near Indian Lake, N. Y., for 1913.

[Drainage area, 85 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
April	2,490	80	472	5.55	6.19	A.
May	2,400	59	272	3.20	3.69	A.
June	266	23	87.6	1.03	1.15	A.
July	80	23	39.6	.466	.54	B.
August	46	23	31.9	.375	.43	B.
September	215	15	48.5	.571	.64	B.
October	774	26	143	1.68	1.94	B.
November	1,970	98	466	5.48	6.10	B.

INDIAN LAKE RESERVOIR AT INDIAN LAKE, N. Y.

Location.—At the dam at the outlet of Indian Lake, about 7½ miles above the mouth of Indian River and about 23½ miles above the village of North Creek.

Records available.—July 22, 1900, to December 31, 1913. Data also published in annual reports of the State engineer and surveyor, State Water Supply Commission, and State of New York Conservation Commission.

Drainage area.—131 square miles, including about 9.3 square miles of water surface of Indian Lake at the elevation of the spillway of the dam.

Gage.—Chain on the crest of the dam; prior to November 17, 1911, a vertical staff. Datum unchanged.

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Regulation.—Indian Lake reservoir provides for a total storage of about 4,700,000,000 cubic feet.

Maximum and minimum gage heights.—Maximum gage height at Indian Lake reservoir was recorded March 28, 1913, when a stage of 38.8 feet was reached. A minimum gage height of 2 feet was recorded March 9 to 18, 1907, and January 3 to 17, 1910.

Daily gage height, in feet, of Indian Lake reservoir at Indian Lake, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.3	34.4	31.5	36.65	34.45	34.85	31.45	24.1	17.4	12.45	12.5	18.2
2	28.4	34.4	31.3	36.5	34.4	34.8	31.3	23.8	17.2	12.25	12.55	18.25
3	28.6	34.45	31.15	36.15	34.35	34.7	31.15	23.55	17.0	12.1	12.65	18.3
4	28.95	34.45	31.0	36.1	34.3	34.6	30.95	23.35	16.8	12.0	12.7	18.4
5	29.15	34.4	30.85	36.2	34.2	34.5	30.7	23.15	16.6	11.9	12.8	18.5
6	29.4	34.4	30.65	36.4	34.2	34.4	30.6	22.95	16.4	11.7	12.9	18.6
7	29.7	34.35	30.3	36.2	34.1	34.3	30.35	22.75	16.2	11.55	12.95	18.7
8	30.15	34.35	30.1	36.0	33.95	34.25	30.15	22.5	16.0	11.35	13.0	19.0
9	30.4	34.35	29.85	35.7	34.0	34.2	30.0	22.3	15.8	11.2	13.55	19.2
10	30.75	34.35	29.6	35.5	33.95	34.15	29.75	22.1	15.5	11.0	14.6	19.3
11	31.0	34.2	29.5	35.45	33.85	34.1	29.55	21.85	15.2	10.8	15.15	19.4
12	31.15	34.0	29.6	35.45	33.8	34.05	29.3	21.6	14.9	10.6	15.6	19.5
13	31.4	33.8	29.65	35.35	33.8	33.95	29.1	21.35	14.75	10.45	15.7	19.7
14	31.65	33.6	29.9	35.3	33.8	33.9	28.85	21.2	14.4	10.3	15.8	19.8
15	31.85	33.4	30.4	35.25	33.75	33.9	28.55	21.0	14.1	10.1	15.9	19.9
16	32.05	33.25	31.15	35.15	33.75	33.85	28.35	20.7	13.9	9.95	16.05	20.0
17	32.15	33.1	31.65	35.05	33.75	33.75	28.1	20.5	13.7	9.75	16.2	20.05
18	32.5	32.95	32.0	34.95	33.75	33.55	27.9	20.3	13.25	9.55	16.3	20.1
19	33.1	32.8	32.3	34.9	33.75	33.4	27.65	20.05	12.9	9.45	16.4	20.15
20	33.5	32.6	32.7	34.85	33.75	33.3	27.4	19.85	12.7	9.6	16.7	20.2
21	34.2	32.4	33.3	34.8	33.7	33.2	27.1	19.65	12.6	10.0	17.0	20.05
22	34.65	32.3	34.2	34.75	33.7	33.0	26.8	19.45	12.5	10.25	17.2	19.85
23	35.0	32.2	34.65	34.65	33.8	32.9	26.6	19.1	12.65	10.6	17.4	19.65
24	35.1	32.05	34.9	34.5	34.0	32.7	26.4	18.85	12.7	10.65	17.6	19.75
25	34.9	31.9	35.9	34.6	34.0	32.5	26.2	18.6	12.75	10.9	17.7	19.8
26	34.85	31.75	37.4	34.55	34.0	32.35	25.95	18.4	12.8	11.2	17.75	19.95
27	34.7	31.65	38.65	34.55	34.0	32.25	25.75	18.2	12.8	11.5	17.8	20.05
28	34.55	31.6	38.8	34.5	34.35	32.1	25.55	18.0	12.8	11.75	17.9	20.1
29	34.4	.....	38.0	34.45	34.75	31.9	25.35	17.8	12.75	12.15	18.0	20.15
30	34.35	.....	37.1	34.45	34.95	31.65	24.95	.....	12.55	12.3	18.1	20.2
31	34.4	.....	36.8	.....	34.9	.....	24.55	17.6	.....	12.4	.....	20.25

Gate openings, in feet, of Indian Lake reservoir at Indian Lake, N. Y., for 1913.

Date.	Sluice gate A open.	Sluice gate B open.	Date.	Sluice gate A open.	Sluice gate B open.
Jan. 27–29	.....	2.5	July 1–8	.....	2.5
Feb. 10–11	.....	2.5	July 9–Sept. 21	.....	5.0
Feb. 12–Mar. 9	.....	5.0	July 29–Aug. 1	5.0	.....
Mar. 6–10	2.5	.....	Sept. 10–21	2.5	.....
Mar. 25–31	.....	4.0	Sept. 29–Oct. 19	.....	5.0
June 17–28	.....	2.5	Dec. 21–23	.....	5.0
June 29–30	.....	5.0			

INDIAN RIVER NEAR INDIAN LAKE, N. Y.

Location.—About three-quarters of a mile below the dam at the outlet of Indian Lake, 1 mile above Big Brook and 8 miles above the mouth.

Records available.—July 1, 1912, to December 31, 1913; also miscellaneous measurements in 1911.

Drainage area.—132 square miles.

Gage.—Vertical staff.

Channel and control.—Rough and rocky.

Regulation.—Flow controlled by storage in Indian Lake.

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Discharge measurements.—Made from a cable about 75 feet below the gage or by wading at the head of the rapids about 150 feet below the gage.

Winter flow.—Gage heights not seriously affected by ice.

Floods.—The river reached a gage height of 7.8 feet on March 28, with a corresponding discharge of 3,460 second-feet, or 23.7 second-feet per square mile of drainage area. By comparison with the run-off of other headwater drainage areas, uncontrolled by storage, this discharge shows the effect of Indian Lake storage in keeping down the flood peak and distributing the run-off over a longer period of time. The mean discharge for a period of 3 days (Mar. 26–29) was 21.2 second-feet per square mile, or 89.5 per cent of the maximum discharge.

Accuracy.—Results good.

Discharge measurements of Indian River near Indian Lake, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 28	Frank Weber	0.52	16.0	July 3	C. S. De Golyer	1.75	201
Mar. 1	do	2.58	467	3	do	2.32	350
1	do	2.18	327	3	do	2.71	485
Apr. 18	C. S. De Golyer	2.98	631	4	do	2.38	376
18	do	2.98	617	5	do	4.00	1,030
July 1	do	3.01	606	5	do	3.82	948
1	do	2.42	387	5	do	3.22	685
1	do	2.88	538	7	do	2.37	375
2	do	.86	47.7	Sept. 11	do	2.90	549
2	do	1.83	217	12	do	1.84	223
3	do	2.58	447				

Daily gage height, in feet, of Indian River near Indian Lake, N. Y., for 1913.

[Lester Severle, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	1.75	2.6	5.2	2.45	2.6	2.8	3.3	2.45	2.3	0.1	0.1
2	.4	1.8	2.6	4.9	2.4	2.6	1.8	2.6	2.45	2.3	.1	.1
3	.45	1.85	2.6	4.7	2.3	2.5	2.3	2.6	2.4	2.3	.1	.1
4	.45	1.85	2.6	4.2	2.2	2.4	2.4	2.6	2.4	2.3	.1	.1
5	.45	1.8	2.6	4.4	2.1	2.3	2.8	2.6	2.4	2.25	.1	.1
6	.45	1.8	2.9	4.4	2.0	2.2	2.4	2.6	2.4	2.25	.1	.15
7	.5	1.75	3.4	4.2	1.95	2.1	2.35	2.6	2.4	2.25	.1	.15
8	.5	1.7	3.2	4.0	1.9	2.0	2.3	2.6	2.4	2.25	.1	.2
9	.5	1.65	3.2	3.8	1.8	1.9	2.6	2.6	2.4	2.2	.1	.2
10	.5	1.65	2.7	3.6	1.75	1.85	3.0	2.6	2.6	2.2	.1	.2
11	.5	2.7	1.63	3.5	1.6	1.8	2.9	2.6	2.9	2.15	.1	.15
12	.6	3.0	.35	3.4	1.5	1.75	2.9	2.6	2.7	2.15	.1	.15
13	.6	2.9	.35	3.4	1.45	1.7	2.9	2.6	2.3	2.15	.15	.15
14	.6	2.8	.35	3.4	1.4	1.7	2.8	2.6	2.9	2.1	.15	.1
15	.65	2.8	.35	3.4	1.4	1.7	2.8	2.6	2.45	2.1	.15	.1
16	.65	2.7	.45	3.2	1.4	1.65	2.8	2.6	2.9	2.05	.15	.1
17	.65	2.7	.45	3.0	1.45	2.1	2.8	2.6	2.7	2.05	.15	.1
18	.67	2.7	.45	2.9	1.5	2.6	2.8	2.6	2.9	2.0	.15	.1
19	.7	2.7	.5	2.8	1.5	2.6	2.8	2.6	2.8	2.0	.15	.1
20	.9	2.7	.5	2.8	1.5	2.6	2.8	2.6	2.8	.05	.15	.1
21	1.55	2.6	.5	2.8	1.5	2.5	2.8	2.6	2.8	.05	.15	2.6
22	2.0	2.7	1.4	2.7	1.5	2.5	2.8	2.5	2.25	.05	.15	2.6
23	2.5	2.7	1.9	2.6	1.5	2.45	2.8	2.5	.05	.05	.15	2.6
24	3.0	2.6	2.2	2.6	1.8	2.4	2.8	2.5	.05	.05	.15	.1
25	3.4	2.6	3.2	2.5	1.8	2.35	2.8	2.5	.05	.05	.1	.1
26	3.3	2.6	5.8	2.5	1.8	2.3	2.8	2.5	.05	.05	.1	.1
27	3.2	2.6	7.1	2.5	1.8	2.3	2.8	2.5	.05	.1	.1	.1
28	3.1	1.95	7.8	2.5	2.1	2.3	2.8	2.5	.05	.1	.1	.1
29	3.0	.....	7.1	2.5	2.6	2.7	2.9	2.45	1.27	.1	.1	.1
30	2.05	.....	6.4	2.45	2.6	3.0	3.6	2.45	2.3	.1	.1	.05
31	1.7	.....	6.2	.....	2.7	.....	3.6	2.45	.....	.1	.....	.05

NOTE.—Gage heights observed at about 4 p. m. Gates at Indian Lake were changed Dec. 20 and 23 after the gage was read. Gage height for July 2 is weighted mean of several readings. Gates at Indian Lake were changed during the day while discharge measurements were being made.

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Daily discharge, in second-feet, of Indian River near Indian Lake, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9	200	453	1,650	402	453	526	725	402	353	1.0	1.0
2	9	212	453	1,480	385	453	212	453	402	353	1.0	1.0
3	12	224	453	1,380	353	418	353	453	385	353	1.0	1.0
4	12	224	453	1,120	322	385	385	453	385	353	1.0	1.0
5	12	212	453	1,220	292	353	526	453	385	338	1.0	1.0
6	12	212	564	1,220	264	322	385	453	385	338	1.0	1.5
7	15	200	767	1,120	250	292	369	453	385	338	1.0	1.5
8	15	189	684	1,030	237	264	353	453	385	338	1.0	2.0
9	15	178	684	941	212	237	453	453	385	322	1.0	2.0
10	15	178	489	853	200	224	603	453	453	322	1.0	2.0
11	15	489	174	810	168	212	564	453	564	307	1.0	1.5
12	22	603	7	767	148	200	564	453	489	307	1.0	1.5
13	22	564	7	767	138	189	564	453	353	307	1.5	1.5
14	22	526	7	767	129	189	526	453	564	292	1.5	1.0
15	26	526	7	767	129	189	526	453	402	292	1.5	1.0
16	26	489	12	684	129	178	526	453	564	278	1.5	1.0
17	26	489	12	603	138	292	526	453	489	278	1.5	1.0
18	28	489	12	564	148	453	526	453	564	264	1.5	1.0
19	31	489	15	526	148	453	526	453	526	264	1.5	1.0
20	53	489	15	526	148	453	526	453	526	.5	1.5	114
21	158	453	15	526	148	418	526	453	526	.5	1.5	453
22	264	489	129	489	148	418	526	418	338	.5	1.5	453
23	418	489	237	453	148	402	526	418	.5	.5	1.5	340
24	603	453	322	453	212	385	526	418	.5	.5	1.5	1.0
25	767	453	684	418	212	369	526	418	.5	.5	1.0	1.0
26	725	453	2,010	418	212	353	526	418	.5	.5	1.0	1.0
27	684	453	2,910	418	212	353	526	418	.5	1.0	1.0	1.0
28	643	250	3,460	418	292	353	526	418	.5	1.0	1.0	1.0
29	603	.....	2,910	418	453	489	564	402	106	1.0	1.0	1.0
30	278	.....	2,420	402	453	603	853	402	353	1.0	1.0	.5
31	189	.....	2,280	.....	489	.....	853	402	.....	1.0	.....	.5

NOTE.—Discharge determined from a rating curve well defined between 15 and 1,300 second-feet. Discharge for Dec. 20 and 23 is weighted mean of discharge before and after change of gates at Indian Lake.

Monthly discharge of Indian River near Indian Lake, N. Y., for 1913.

Month.	Discharge in second-feet.			Accuracy.	Month.	Discharge in second-feet.			Accuracy.
	Maximum.	Minimum.	Mean.			Maximum.	Minimum.	Mean.	
January	767	9	185	A.	August	725	402	449	A.
February	603	178	381	A.	September	564	.5	344	A.
March	3,460	7	745	A.	October	353	.5	194	A.
April	1,650	402	774	A.	November	1.5	1.0	1.20	A.
May	489	129	236	A.	December	453	.5	44.9	A.
June	603	178	345	A.					
July	853	212	517	A.	The year	3,460	.5	351	

SCHROON RIVER AT RIVERBANK, N. Y.

Location.—At the highway bridge at Riverbank, a mile below Tumblehead Falls, 3½ miles below the outlet of Brant Lake, 9 miles below Schroon Lake, and about 9 miles north of Warrensburg.

Records available.—September 2, 1907, to December 31, 1913. Data also published in annual reports of New York State Water Supply Commission, State engineer and surveyor, and the State Conservation Commission.

Drainage area.—534 square miles.

Gage.—Chain on the highway bridge.

Channel and control.—Gravel, smooth, and practically permanent.

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Discharge measurements.—Made from the bridge.

Regulation.—Flow affected by storage in Schroon and Brant lakes.

Winter flow.—Somewhat affected by ice; not seriously affected during 1913.

Floods.—The flood of March 25 to 30, 1913, reached a stage of 10.7 feet at 5 p. m. March 28, as recorded by the observer. Corresponding discharge was approximately 13,500 second-feet, or 25.3 second-feet per square mile of drainage area. This peak was probably somewhat reduced by storage in Schroon and Brant lakes. The mean discharge for March 27 to 29 was approximately 21 second-feet per square mile.

Accuracy.—Results good.

Discharge measurements of Schroon River at Riverbank, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 11	Frank Weber	[a] 3.36	668	Apr. 21	C. S. DeGolyer	3.66	1,340
Mar. 4	R. S. Barnes	[a] 2.20	362	May 28	do	3.40	988
20	C. S. DeGolyer	[b] 4.34	1,590	Aug. 5	do	1.40	121
Apr. 10	do	5.37	2,980	Oct. 2	G. H. Canfield	1.36	114
10	do	5.36	2,930	2	do	1.36	113

[a] Control under partial ice cover during measurement. [b] Logs lodged on control.

Daily gage height, in feet, of Schroon River at Riverbank, N. Y., for 1913.

[J. H. Roberts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.8	3.4	2.25	7.1	3.8	4.1	2.45	1.28	1.22	1.22	1.8	2.4
2	2.8	3.4	2.2	6.7	3.8	4.1	2.35	1.32	1.20	1.36	1.8	2.4
3	2.8	3.3	2.25	6.3	3.8	4.0	2.25	1.30	1.22	1.34	1.8	2.3
4	3.0	3.1	2.25	6.0	3.5	3.9	2.3	1.35	1.20	1.30	1.85	2.3
5	3.0	3.0	2.4	6.2	3.5	3.9	2.1	1.45	1.18	1.30	1.9	2.3
6	3.1	3.0	2.4	6.6	3.4	3.8	2.05	1.40	1.15	1.35	1.85	2.3
7	3.1	2.95	2.4	6.6	3.6	3.4	2.1	1.45	1.20	1.35	1.85	2.25
8	3.2	2.95	2.45	6.1	3.2	3.1	1.8	1.38	1.15	1.34	1.85	2.3
9	3.4	2.9	2.3	5.7	3.1	3.4	1.32	1.35	1.15	1.39	1.9	2.35
10	3.4	2.95	2.45	5.4	3.1	3.3	1.42	1.30	1.15	1.38	2.0	2.4
11	3.1	3.3	2.35	4.9	2.95	2.4	1.40	1.32	1.10	1.30	2.05	2.55
12	3.2	3.0	2.6	4.6	2.9	2.45	1.38	1.38	1.12	1.30	2.15	2.45
13	3.2	3.2	2.55	4.5	2.9	2.4	1.42	1.40	1.15	1.40	2.15	2.5
14	3.2	2.8	3.2	4.5	2.8	2.4	1.40	1.35	1.10	1.42	2.15	2.5
15	3.0	2.9	3.2	4.4	2.9	2.3	1.45	1.30	1.12	1.45	1.8	2.5
16	2.95	2.65	3.1	4.2	2.6	2.35	1.45	1.30	1.10	1.45	2.15	2.45
17	3.0	2.55	3.6	4.2	2.6	2.95	1.40	1.30	1.18	1.40	2.2	2.45
18	3.1	2.45	3.8	4.0	2.55	2.7	1.45	1.28	1.10	1.45	2.2	2.45
19	3.4	2.5	4.0	4.0	2.6	3.2	1.40	1.25	1.12	1.45	2.2	2.4
20	3.5	2.3	4.2	3.7	2.65	2.9	1.30	1.32	1.15	1.65	2.3	2.3
21	3.7	2.25	4.6	3.6	2.5	2.7	1.40	1.30	1.10	1.7	2.4	2.3
22	3.8	2.35	5.2	3.7	2.5	2.1	1.38	1.32	1.25	1.6	2.45	2.35
23	3.9	2.35	5.3	3.6	2.65	2.65	1.38	1.30	1.15	1.6	2.5	2.3
24	3.9	2.3	5.2	3.6	3.1	3.1	1.40	1.25	1.10	1.6	2.5	2.25
25	3.9	2.25	6.0	3.6	3.2	3.0	1.42	1.28	1.18	1.7	2.55	2.3
26	3.8	2.15	7.7	3.7	3.4	3.0	1.45	1.22	1.18	1.75	2.5	2.35
27	3.8	2.2	9.2	3.7	3.5	3.0	1.30	1.25	1.10	1.8	2.5	2.3
28	3.6	2.2	10.6	3.7	4.2	3.0	1.20	1.20	1.10	2.15	2.5	2.5
29	3.5	.....	9.9	3.8	4.3	1.6	1.35	1.20	1.28	2.45	2.45	2.5
30	3.4	.....	8.7	3.8	4.2	2.4	1.35	1.25	1.25	2.4	2.4	2.55
31	3.3	.....	7.6	.....	4.2	.....	1.30	1.20	.....	2.1	.....	2.45

NOTE.—Discharge relation affected by ice and log jams during the greater part of February and March, and the last four days in December.

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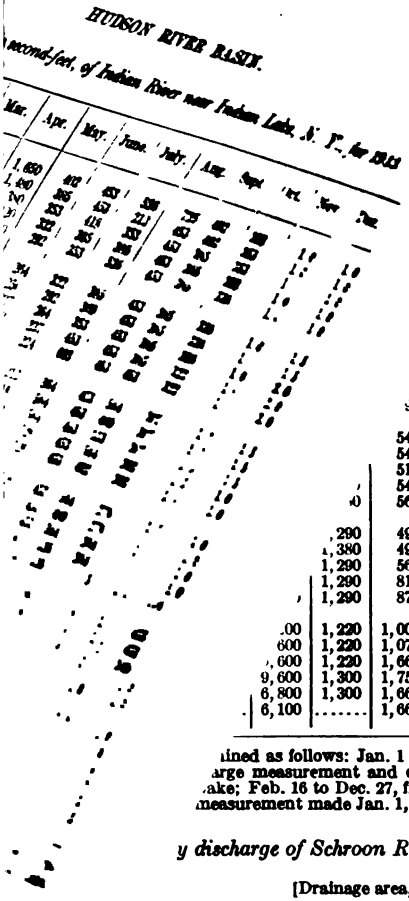

...nk, N. Y., for 1913.

...g.	Sept.	Oct.	Nov.	Dec.
95	83	83	230	450
103	79	112	230	450
99	83	108	230	410
110	79	99	246	410
134	75	99	262	410
121	70	110	246	410
134	79	110	246	390
117	70	108	246	410
110	70	119	262	430
126	99	70	117	296	450
121	103	61	99	314	518
117	117	65	99	351	472
126	121	70	121	351	495
121	110	61	126	351	495
134	99	65	134	230	495
134	99	61	134	351	472
121	99	75	121	370	472
134	95	61	134	370	472
121	89	65	134	370	450
99	103	70	186	410	410
121	99	61	200	450	410
117	103	89	172	472	430
117	99	70	172	495	410
121	89	61	172	495	390
126	95	75	200	518	410
134	83	75	215	495	430
99	89	61	230	495	410
79	79	61	351	495	390
110	79	95	472	472	390
110	89	89	450	450	390
99	79	.....	332	.....	370

...ined as follows: Jan. 1 to Feb. 4, from a well-defined rating curve; Feb. 5–15, ...arge measurement and comparisons with Hudson River at North Creek and ...ake; Feb. 16 to Dec. 27, from a fairly well defined rating curve; Dec. 28–31, esti... measurement made Jan. 1, 1914.

...y discharge of Schroon River at Riverbank, N. Y., for 1913.

[Drainage area, 534 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
.....	1,570	721	1,080	2.02	2.33	B.
.....	1,120	351	592	1.11	1.16	B.
.....	10,600	370	2,450	4.59	5.29	C.
.....	5,370	1,220	2,480	4.64	5.18	A.
.....	1,750	495	931	1.74	2.01	A.
.....	1,560	172	795	1.49	1.66	A.
...gust.....	472	79	181	.339	.39	A.
...tember.....	134	79	101	.189	.22	B.
...tober.....	95	61	71.6	.134	.15	B.
...ovember.....	472	83	172	.322	.37	A.
December.....	518	230	360	.674	.75	A.
	518	370	432	.809	.93	A.
The year.....	10,600	61	804	1.51	20.44	

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SACANDAGA RIVER NEAR HOPE, N. Y.

Location.—About 1½ miles below the junction of the east and west branches, 3½ miles above the post office at Hope, 4 miles below Wells, and 12 miles above Northville.

Records available.—September 15, 1911, to December 31, 1913.

Drainage area.—494 square miles.

Gage.—Staff in two sections, the lower section inclined, the upper, vertical.

Channel and control.—Rocky; practically permanent.

Discharge measurements.—Made from a cable, or by wading.

Winter flow.—Affected by ice.

Floods.—The flood of March 25 to 30, 1913, reached a stage of 10 feet at 5.30 p. m. March 27, as reported by the observer, with a corresponding discharge of approximately 24,800 second-feet, or 50 second-feet per square mile of drainage area. Later determinations indicate that the maximum stage reached by the flood was about 11.7 feet.

Accuracy.—Results good for open-water season.

Discharge measurements of Sacandaga River near Hope, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 19	C. S. De Golyer	2.96	736	May 21	C. S. De Golyer	2.65	554
21	do	3.75	1,630				

Daily gage height, in feet, of Sacandaga River near Hope, N. Y., for 1913.

[Edgar Coulombe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	3.45	2.9	5.8	4.1	3.6	1.92	1.59	1.42	1.58	2.9	2.8
2	3.1	3.3	2.75	5.2	4.2	3.6	1.83	1.64	1.40	1.94	2.8	2.75
3	3.85	3.15	2.75	4.8	3.3	3.5	1.78	1.74	1.38	2.44	2.65	2.8
4	4.6	3.1	2.85	4.7	3.15	3.4	1.78	1.74	1.36	2.16	2.7	2.85
5	4.2	2.95	2.65	5.1	3.4	.....	1.76	1.67	1.36	2.00	2.7	2.85
6	4.0	2.85	.....	4.9	3.3	.....	1.73	1.64	1.36	1.84	2.65	2.8
7	4.2	2.8	.....	4.2	2.75	.....	1.71	1.60	1.36	1.86	2.55	3.05
8	4.6	2.75	.....	4.0	2.95	.....	1.68	1.52	1.41	1.79	2.5	4.2
9	4.7	2.65	.....	4.0	2.6	2.9	1.55	1.46	1.35	1.74	5.7	3.5
10	4.2	2.65	.....	3.8	2.4	2.85	1.87	1.48	1.27	1.70	6.2	3.5
11	4.1	2.6	3.1	4.0	2.9	2.7	1.88	1.49	1.27	1.68	4.8	3.45
12	4.2	2.55	2.95	4.2	3.25	2.65	1.87	1.48	1.26	1.75	4.4	3.1
13	4.1	2.55	2.9	4.0	3.15	2.6	1.92	1.45	1.26	1.76	4.0	3.15
14	3.9	2.75	4.9	3.7	3.05	2.23	1.84	1.43	1.24	1.74	3.8	3.1
15	3.75	2.7	5.4	3.6	2.9	2.16	1.78	1.42	1.24	1.68	3.6	3.05
16	3.6	2.6	5.6	3.4	.....	2.38	1.68	1.42	1.22	1.62	3.45	2.95
17	3.8	2.7	4.5	3.4	.....	2.24	1.68	1.53	1.40	1.72	3.3	2.85
18	4.7	2.7	4.2	3.3	.....	2.13	1.53	1.57	1.30	1.57	3.2	2.8
19	5.2	2.75	4.2	4.2	.....	2.08	1.67	1.48	1.30	1.64	3.1	2.55
20	4.8	2.65	4.9	3.8	2.55	2.26	1.67	1.46	1.18	2.75	3.8	2.7
21	5.6	2.65	6.2	3.8	2.5	2.25	1.67	1.39	1.32	4.0	3.8	2.6
22	5.0	2.85	6.2	3.5	2.7	2.12	1.62	1.38	2.8	3.3	3.6	2.55
23	4.3	3.3	5.2	3.35	4.0	2.48	1.62	1.39	2.39	3.0	3.5	2.65
24	4.6	3.25	5.1	3.8	4.4	2.43	1.65	.....	2.04	2.85	3.4	2.55
25	4.3	3.15	7.1	3.4	4.1	2.40	1.69	.....	1.90	3.6	3.3	2.5
26	4.0	3.0	8.2	3.2	3.7	2.18	1.64	1.42	1.74	4.0	3.15	2.5
27	3.9	2.9	9.8	3.05	3.5	2.5	1.62	1.52	1.66	3.9	3.0	2.5
28	3.65	2.9	7.8	3.6	4.8	2.38	1.74	1.48	1.62	3.6	2.9	.....
29	3.4	.....	6.6	4.0	5.3	2.07	1.82	1.46	1.72	3.4	2.9	2.3
30	3.45	.....	5.9	4.2	4.7	1.93	1.73	1.51	1.60	3.3	2.85	.....
31	3.3	.....	5.8	.....	.....	.....	1.65	1.46	.....	3.1	.....	2.75

NOTE.—Discharge relation Feb. 10 to Mar. 13 and Dec. 31 affected by ice.

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Daily discharge, in second-feet, of Sacandaga River near Hope, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,090	1,240	.....	5,790	2,070	1,400	204	94	54	92	740	666
2	900	1,090	.....	4,230	2,230	1,400	171	109	50	212	666	632
3	1,720	945	.....	3,330	1,090	1,290	153	140	46	440	566	666
4	2,930	900	.....	3,130	945	1,190	153	140	43	303	598	703
5	2,230	780	.....	3,990	1,190	1,070	147	118	43	235	598	703
6	1,920	703	.....	3,540	1,090	980	137	109	43	174	566	666
7	2,230	666	.....	2,230	632	890	130	97	43	182	504	860
8	2,930	632	.....	1,920	780	810	121	76	52	157	474	2,230
9	3,130	566	.....	1,920	534	740	84	63	41	140	5,520	1,290
10	2,230	.....	.....	1,650	418	703	185	67	28	127	6,930	1,290
11	2,070	.....	.....	1,920	740	598	189	69	28	121	3,330	1,240
12	2,230	.....	.....	2,230	1,040	566	185	67	27	144	2,560	900
13	2,070	.....	.....	1,920	945	534	204	60	27	147	1,920	945
14	1,780	.....	3,540	1,520	860	335	174	56	25	140	1,650	900
15	1,580	.....	4,730	1,400	740	303	153	54	25	121	1,400	860
16	1,400	.....	5,250	1,190	610	408	121	54	22	103	1,240	780
17	1,650	.....	2,740	1,190	520	339	121	79	50	134	1,090	703
18	3,130	.....	2,230	1,090	500	290	79	89	32	89	990	666
19	4,230	.....	2,230	2,230	580	269	118	67	32	109	900	504
20	3,330	.....	3,540	1,650	504	349	118	63	18	632	1,650	598
21	5,250	.....	6,930	1,650	474	344	118	48	36	1,920	1,650	534
22	3,760	.....	6,930	1,290	598	286	103	46	666	1,090	1,400	504
23	2,390	.....	4,230	1,140	1,920	463	103	48	413	820	1,290	566
24	2,930	.....	3,990	1,650	2,560	435	112	50	252	703	1,190	504
25	2,390	.....	9,900	1,190	2,070	418	124	52	196	1,400	1,090	474
26	1,920	.....	14,500	990	1,520	312	109	54	140	1,920	945	474
27	1,780	.....	23,500	860	1,290	474	103	76	115	1,780	820	474
28	1,460	.....	12,700	1,400	3,330	408	140	67	103	1,400	740	420
29	1,190	.....	8,160	1,920	4,480	264	167	63	134	1,190	740	367
30	1,240	.....	6,070	2,230	3,130	208	137	74	97	1,090	703	367
31	1,090	.....	5,790	.....	2,100	.....	112	63	.....	900	.....	367

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge Feb. 10-28 estimated 477 second-feet; Mar. 1-13 estimated 600 second-feet, by comparison with Sacandaga River at Hadley, N. Y.

Monthly discharge of Sacandaga River near Hope, N. Y., for 1913.

[Drainage area, 494 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	5,250	900	2,260	4.57	5.27	A.
February	1,240	.....	592	1.20	1.25	C.
March	23,500	.....	4,350	8.81	10.16	C.
April	5,790	860	2,080	4.21	4.70	A.
May	4,480	418	1,340	2.71	3.12	A.
June	1,400	208	603	1.22	1.36	A.
July	204	79	138	.279	.32	A.
August	140	46	74.6	.151	.17	B.
September	666	18	96.0	.194	.22	A.
October	1,920	89	581	1.18	1.36	A.
November	6,930	474	1,480	3.00	3.35	A.
December	2,230	367	737	1.49	1.72	A.
The year	23,500	18	1,200	2.43	33.00	

SACANDAGA RIVER AT HADLEY, N. Y.

Location.—About half a mile west of the railroad station at Hadley, a mile above the mouth, and 4½ miles below the site of the proposed storage dam at Conklingsville.

Records available.—January 1, 1911, to December 31, 1913; September 13, 1907, to December 31, 1910, at upper bridge station; September 24, 1909, to midsummer, 1911, at the lower bridge station.

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Drainage area.—1,060 square miles.

Gage.—Barrett & Lawrence automatic gage, referred to vertical staff gage.

Channel and control.—Rough but practically permanent. The channel at the cable has been cleared of bowlders so far as feasible.

Discharge measurements.—Made from a cable about 30 feet above the gage, or by wading about three-quarters of a mile above the gage.

Winter flow.—Seriously affected by ice.

Floods.—The floods of March 25 to 30, 1913, reached a stage of 12.36 feet between 11 and 12 a. m. March 28, as shown by the automatic gage, and later verified from high-water marks. The corresponding discharge was approximately 35,500 second-feet, or 33.5 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Sacandaga River at Hadley, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10	Frank Weber	a 3.94	1,080	Apr. 12	C. S. De Golyer	5.67	3,220
19	do	a 4.12	677	Sept. 23	do	3.65	810
Mar. 4	do	a 3.97	965	Dec. 30	do	a 4.67	894
30	J. G. Mathers	9.83	18,600				

a Made under partial ice cover.

Daily gage height, in feet, of Sacandaga River at Hadley, N. Y., for 1913.

[J. A. Clark, jr., observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.7	4.8	4.0	8.2	5.0	6.2	3.0	2.78	2.54	2.69	4.3	4.05
2	4.7	4.6	4.0	7.8	4.9	5.8	2.91	2.72	2.49	2.73	4.1	4.0
3	4.8	4.4	4.1	7.4	4.8	5.4	2.87	2.65	2.46	2.97	3.9	4.0
4	5.5	4.35	3.95	7.0	4.7	5.1	2.83	2.63	2.38	3.4	3.85	4.1
5	4.7	4.3	3.9	6.8	4.35	4.8	2.79	2.63	2.37	3.3	3.8	4.15
6	5.8	4.1	3.85	6.7	4.6	4.5	2.76	2.61	2.37	3.15	3.8	4.15
7	5.9	4.0	3.75	6.5	4.45	4.3	2.73	2.60	2.37	3.05	3.75	4.2
8	6.0	3.9	3.7	6.3	4.15	4.05	2.70	2.59	2.37	2.95	3.7	5.1
9	6.1	3.95	3.7	6.0	4.2	4.0	2.68	2.56	2.36	2.88	4.5	5.4
10	6.1	3.9	4.1	5.7	3.95	3.95	2.66	2.53	2.36	2.83	6.5	5.2
11	6.0	3.95	4.45	5.5	3.85	3.85	2.61	2.48	2.36	2.80	7.0	5.0
12	6.0	4.2	4.6	5.7	3.7	3.75	2.78	2.46	2.34	2.76	7.0	4.5
13	5.8	4.4	4.8	5.8	4.15	3.65	2.83	2.43	2.31	2.75	6.6	4.45
14	5.7	4.4	5.7	5.8	4.2	3.6	2.82	2.42	2.29	2.76	6.2	4.5
15	5.6	4.3	6.2	5.6	4.15	3.45	2.81	2.41	2.28	2.76	5.8	4.4
16	5.4	4.2	6.8	5.5	4.05	3.3	2.78	2.40	2.25	2.72	5.4	4.25
17	5.4	4.2	7.1	5.3	3.95	3.4	2.73	2.40	2.26	2.72	5.0	4.2
18	5.7	4.15	7.1	5.1	3.9	3.35	2.68	2.39	2.27	2.71	4.7	4.15
19	6.2	4.1	6.8	5.1	3.7	3.25	2.66	2.39	2.28	2.72	4.5	3.95
20	6.5	4.0	6.8	5.3	3.9	3.2	2.63	2.44	2.31	2.92	4.6	3.65
21	6.8	3.9	6.8	5.3	3.9	3.35	2.62	2.44	2.38	4.15	5.1	3.75
22	6.9	4.15	7.3	5.2	3.9	3.35	2.61	2.41	2.56	4.35	5.2	3.8
23	6.9	4.5	7.7	5.0	4.4	3.3	2.60	2.37	3.45	4.5	5.0	3.65
24	6.7	4.8	7.5	4.9	5.4	3.3	2.60	2.34	3.55	4.15	4.8	3.5
25	6.5	4.8	7.6	4.8	5.6	3.35	2.59	2.33	3.2	4.25	4.7	3.65
26	6.3	4.5	9.5	4.8	5.6	3.3	2.60	2.33	3.05	5.0	4.5	3.6
27	6.0	4.2	11.4	4.6	5.3	3.25	2.61	2.42	2.96	5.5	4.35	3.7
28	5.8	4.1	12.2	4.4	5.5	3.3	2.62	2.44	2.85	5.4	4.2	4.25
29	5.4	.....	11.2	4.9	6.3	3.35	2.61	2.50	2.78	5.1	4.1	4.7
30	5.1	.....	10.0	5.1	6.7	3.2	2.76	2.53	2.71	4.8	4.1	4.7
31	4.9	.....	8.8	.....	6.6	.....	2.80	2.54	.....	4.6	.....	4.6

NOTE.—Discharge relation affected by ice Feb. 11 to Mar. 8, and Dec. 25–31.

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Daily discharge, in second-feet, of Sacandaga River at Hadley, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,050	2,210	1,000	11,300	2,540	5,080	366	254	153	214	1,500	1,220
2	2,050	1,900	980	9,840	2,370	4,130	317	227	135	232	1,270	1,160
3	2,210	1,630	970	8,500	2,210	3,270	297	197	124	350	1,060	1,160
4	3,470	1,570	960	7,280	2,050	2,710	278	189	98	622	1,010	1,270
5	2,050	1,500	900	6,690	1,570	2,210	258	189	95	552	956	1,330
6	4,130	1,270	870	6,400	1,900	1,760	245	180	95	455	956	1,330
7	4,130	1,270	870	6,400	1,900	1,760	245	180	95	455	956	1,330
7	4,360	1,160	860	5,850	1,700	1,500	232	176	95	395	910	1,380
8	4,600	1,060	850	5,330	1,330	1,220	218	172	95	339	864	2,710
9	4,840	1,110	864	4,600	1,380	1,160	210	161	92	302	1,760	3,270
10	4,840	1,080	1,270	3,900	1,110	1,110	201	149	92	278	5,850	2,890
11	4,600	960	1,700	3,470	1,010	1,010	180	131	92	263	7,280	2,540
12	4,600	880	1,900	3,900	864	910	254	124	86	245	7,280	1,760
13	4,130	800	2,210	4,130	1,330	821	278	114	77	240	6,120	1,700
14	3,900	740	3,900	4,130	1,380	778	273	111	72	245	5,080	1,760
15	3,680	700	5,080	3,680	1,330	660	268	107	69	245	4,130	1,630
16	3,270	660	6,690	3,470	1,220	552	254	104	61	227	3,270	1,440
17	3,270	650	7,580	3,080	1,110	622	232	104	64	227	2,540	1,380
18	3,900	660	7,580	2,710	1,060	587	210	101	67	222	2,050	1,330
19	5,080	680	6,690	2,710	864	519	201	101	69	227	1,760	1,110
20	5,850	750	6,690	3,080	1,060	486	189	118	77	323	1,900	821
21	6,690	860	6,690	3,080	1,060	587	184	118	98	1,330	2,710	910
22	6,980	1,100	8,180	2,890	1,060	587	180	107	161	1,570	2,890	956
23	6,980	1,350	9,500	2,540	1,630	552	176	95	660	1,760	2,540	821
24	6,400	1,500	8,820	2,370	3,270	552	176	86	738	1,330	2,210	698
25	5,850	1,350	9,160	2,210	3,680	587	172	83	486	1,440	2,050	660
26	5,330	1,240	17,000	2,210	3,680	552	176	83	395	2,540	1,760	660
27	4,600	1,120	28,300	1,900	3,080	519	180	111	344	3,470	1,570	738
28	4,130	1,050	33,500	1,630	3,470	552	184	118	288	3,270	1,380	821
29	3,270	.....	26,900	2,370	5,330	587	180	138	254	2,710	1,270	864
30	2,710	.....	19,500	2,710	6,400	486	245	149	222	2,210	1,270	864
31	2,370	.....	13,700	.....	6,120	.....	263	153	.....	1,900	.....	864

NOTE.—Discharge determined from a well-defined rating curve. Discharge Feb. 11 to Mar. 8 and Dec. 25-31 determined from discharge measurements and comparisons with records at stations on Hudson River.

Monthly discharge of Sacandaga River at Hadley, N. Y., for 1913.

[Drainage area, 1,060 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	6,980	2,050	4,260	4.02	4.64	A.
February	2,210	650	1,130	1.07	1.11	B.
March	33,500	850	7,770	7.33	8.45	A.
April	11,300	1,630	4,270	4.03	4.50	A.
May	6,400	864	2,200	2.08	2.40	A.
June	5,080	486	1,220	1.15	1.28	A.
July	366	172	228	.215	.25	A.
August	254	83	137	.129	.15	B.
September	738	62	192	.172	.19	A.
October	3,470	214	959	.905	1.04	A.
November	7,280	864	2,570	2.42	2.70	A.
December	3,270	660	1,360	1.28	1.48	B.
The year	33,500	62	2,200	2.08	28.19	

WEST BRANCH OF SACANDAGA RIVER AT BLACKBRIDGE, NEAR WELLS, N. Y.

Location.—At the highway bridge known as Blackbridge, 2 miles above the junction of the east and west branches of Sacandaga River and about 3 miles west of Wells. Replaces station formerly located at Whitehouse.

Records available.—March 14, 1911, to December 31, 1913.

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Drainage area.—211 square miles.
Gage.—Chain on upstream side of highway bridge.
Channel.—Rocky; practically permanent.
Discharge measurements.—Made from the bridge or by wading.
Regulation.—Flow slightly affected by storage dams used for logging in the spring.
Winter flow.—Not seriously affected by ice.
Floods.—The flood of March 25 to 30, 1913, reached a stage of 11.5 feet at 4 p. m. March 27, as recorded by the observer, with a corresponding discharge of approximately 29,000 second-feet, or 137 second-feet per square mile of drainage area. Later determinations of the elevations of high-water marks indicate that the crest of the flood reached a considerably higher stage than that noted by the observer.
Accuracy.—Results good.

Discharge measurements of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 20	C. S. De Golyer	3.96	268
20	.....do	3.96	268

Daily gage height, in feet, of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for 1913.

[Cornelius De Groff, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	8.4	4.2	7.0	4.3	4.9	3.05	2.80	2.58	2.72	4.3	3.9
2	4.4	4.4	4.1	6.2	4.55	4.8	3.05	3.20	2.50	3.41	4.1	3.9
3	4.8	4.35	3.9	6.1	4.8	4.7	3.10	3.10	2.50	3.8	4.0	3.85
4	5.6	4.3	3.8	5.9	4.15	4.6	2.88	3.25	2.50	3.65	4.5	3.8
5	5.35	4.2	3.75	6.3	4.75	4.55	2.80	2.88	2.44	3.40	4.1	3.85
6	5.3	4.15	3.8	6.0	4.85	4.35	2.88	2.78	2.44	3.26	3.95	3.8
7	5.6	4.1	4.1	5.25	3.9	4.35	2.80	2.76	2.42	3.18	3.9	3.7
8	6.0	3.9	4.6	5.45	4.6	4.0	2.78	2.72	2.40	3.10	3.8	5.15
9	5.8	3.8	4.2	5.3	3.65	4.2	2.61	2.70	2.42	3.05	6.2	4.75
10	5.7	3.7	4.0	5.15	3.65	4.1	3.12	2.62	2.41	2.95	6.4	4.65
11	5.5	3.6	3.9	5.35	3.41	4.2	3.22	2.64	2.35	2.81	5.9	4.5
12	5.7	3.48	3.85	5.4	4.2	4.15	3.12	2.66	2.35	2.90	5.6	4.35
13	5.5	3.5	3.8	5.15	4.7	3.95	3.18	2.70	2.32	3.00	5.15	4.3
14	5.4	3.65	5.15	4.7	4.6	3.55	3.25	2.62	2.32	2.90	5.1	4.2
15	5.2	3.75	5.3	4.6	4.45	3.10	2.84	2.60	2.32	2.68	5.4	4.1
16	5.1	3.75	6.2	4.4	4.1	3.45	2.82	2.55	2.32	2.66	4.65	4.25
17	5.2	3.75	5.5	4.2	4.2	3.25	2.68	2.51	2.30	2.80	4.5	4.0
18	6.2	3.9	5.45	4.15	3.46	3.08	2.72	2.61	2.38	2.84	4.45	3.9
19	6.4	3.4	5.3	4.55	4.35	2.98	2.71	2.58	2.40	2.82	4.3	3.7
20	6.2	3.6	5.8	4.7	3.9	3.48	2.78	2.48	2.35	4.2	5.2	3.7
21	7.2	3.7	6.2	4.35	3.8	3.20	2.74	2.40	2.31	5.15	5.3	3.7
22	5.9	3.7	7.0	4.3	3.9	3.35	2.71	2.40	4.25	4.9	5.0	3.6
23	5.8	4.2	6.4	4.2	5.35	4.05	2.62	2.52	3.55	4.4	5.35	3.7
24	5.7	4.3	6.3	4.1	5.5	3.9	2.82	2.54	3.5	4.3	4.75	3.65
25	6.4	4.3	9.0	4.2	5.5	3.9	2.92	2.50	3.20	5.3	4.6	3.55
26	5.45	4.5	9.6	4.15	5.2	3.9	2.80	2.42	3.10	5.45	4.6	3.55
27	5.35	4.55	11.0	4.1	4.7	4.2	2.81	2.62	3.10	5.25	4.3	3.42
28	5.45	4.55	8.4	4.0	6.0	4.25	2.80	2.61	2.82	4.65	4.2	3.5
29	5.4	.....	7.7	4.45	6.0	3.35	3.10	2.75	2.75	4.9	4.3	3.49
30	4.75	.....	7.3	4.4	5.7	4.05	2.94	2.71	2.72	4.6	4.2	3.5
31	4.6	.....	7.4	.....	5.5	.....	2.88	2.58	.....	4.5	.....	3.5

NOTE.—Discharge relation affected by ice Feb. 13 to Mar. 10, and Dec. 31. Gage height of Feb. 1 probably in error.

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Daily discharge, in second-feet, of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	517	490	.....	3,540	414	770	65	36	17	28	414	251
2	464	464	.....	2,120	545	700	65	86	12	122	326	251
3	700	439	.....	1,980	700	634	72	72	12	218	287	234
4	1,380	414	.....	1,720	347	573	44	94	12	176	517	218
5	1,140	368	.....	2,270	667	545	36	44	9	120	326	234
6	1,090	347	.....	1,850	735	439	44	34	9	96	269	218
7	1,380	326	.....	1,050	251	439	36	32	8	83	251	189
8	1,850	251	.....	1,230	573	287	34	28	7	72	218	968
9	1,600	218	.....	1,090	176	368	19	26	8	65	2,120	667
10	1,490	189	.....	968	176	326	75	20	8	52	2,430	604
11	1,280	163	251	1,140	122	368	89	21	5	47	1,720	517
12	1,490	136	234	1,180	368	347	75	23	5	46	1,380	439
13	1,280	.....	218	968	634	269	83	26	4	58	968	414
14	1,180	.....	968	634	573	152	94	20	4	46	926	368
15	1,010	.....	1,090	573	490	72	40	18	4	24	1,180	326
16	926	.....	2,120	464	326	130	38	15	4	23	604	439
17	1,010	.....	1,280	368	368	94	24	13	3	36	517	287
18	2,120	.....	1,230	347	132	69	28	19	6	40	490	251
19	2,430	.....	1,090	545	439	56	27	17	7	38	414	189
20	2,120	.....	1,600	634	251	136	34	11	5	368	1,010	189
21	3,900	.....	2,120	439	218	86	30	7	3	968	1,090	189
22	1,720	.....	3,540	414	251	111	27	7	391	770	846	163
23	1,600	.....	2,430	368	1,140	306	20	13	152	464	1,140	189
24	1,490	.....	2,270	326	1,280	251	38	14	140	414	667	176
25	2,430	.....	10,200	368	1,280	251	48	12	86	1,090	573	152
26	1,230	.....	13,500	347	1,010	251	46	8	72	1,230	490	152
27	1,140	.....	24,000	326	634	368	37	20	72	1,050	414	124
28	1,230	.....	7,600	287	1,850	391	36	19	38	604	368	140
29	1,180	.....	5,290	490	1,850	111	72	31	31	770	414	120
30	667	.....	4,230	464	1,490	306	51	27	28	573	368	140
31	573	.....	4,480	.....	1,280	.....	44	17	.....	517	.....	140

NOTE.—Discharge determined from a well-defined rating curve. Figures for Feb. 1 and Dec. 31 estimated. Mean discharge Feb. 13–28, estimated 187 second-feet, and Mar. 1–10, 228 second-feet, by comparison with records on Sacandaga River at Hope and at Hadley.

Monthly discharge of West Branch of Sacandaga River at Blackbridge, near Wells, N. Y., for 1913.

[Drainage area, 211 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	3,990	464	1,410	6.68	7.70	A.
February	.....	.....	243	1.15	1.20	C.
March	24,000	.....	2,970	14.1	16.26	C.
April	3,540	287	950	4.50	5.02	A.
May	1,850	122	664	3.15	3.63	A.
June	770	56	307	1.45	1.62	A.
July	94	19	47.5	.225	.26	A.
August	94	7	26.8	.127	.15	B.
September	391	3	38.7	.183	.20	A.
October	1,230	23	329	1.56	1.80	A.
November	2,430	218	758	3.59	4.00	A.
December	968	120	288	1.36	1.57	A.
The year	24,000	3	674	3.19	43.41	

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HOOSIC RIVER NEAR EAGLE BRIDGE, N. Y.

Location.—Half a mile below Walloomsac River and 1½ miles above Owlkill Creek and Eagle Bridge.

Records available.—August 13, 1910, to December 31, 1913; September 25, 1903, to December 31, 1908, at Buskirk, 4 miles below the present station.

Drainage area.—512 square miles.

Gage.—Chain on left bank.

Channel and control.—Gravel; somewhat shifting.

Discharge measurements.—Made from a cable a mile below the gage, or by wading.

Regulation.—Flow affected by storage on Walloomsac River and at Hoosic Falls about 2 miles above the gage.

Accuracy.—Results good. Low stage discharges may be slightly in error because of regulation.

Discharge measurements of Hoosic River near Eagle Bridge, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 15	C. S. De Golyer	12.46	5,070
Sept. 24	R. S. Barnes	7.52	221

Daily gage height, in feet, of Hoosic River near Eagle Bridge, N. Y., for 1913.

[Mrs. Vashti Russell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.7	9.9	9.6	11.6	8.4	8.6	7.40	7.18	6.68	6.88	8.1	8.3
2	9.4	8.6	9.0	10.5	8.15	8.6	7.20	6.95	6.53	6.90	7.65	8.05
3	9.8	8.7	8.6	10.1	8.1	8.3	7.08	6.68	6.58	7.00	7.85	8.0
4	10.9	8.7	8.6	9.8	8.1	8.25	6.92	7.13	7.01	7.00	7.9	7.8
5	9.6	8.35	8.4	10.0	8.0	8.05	7.00	6.91	7.03	6.82	7.6	8.1
6	9.6	8.25	8.3	9.7	8.1	7.85	.....	7.08	7.01	7.18	7.6	8.0
7	10.8	8.15	7.85	9.6	8.0	7.8	.....	6.95	6.78	6.98	7.5	8.0
8	12.2	8.15	8.0	9.4	7.8	7.8	.....	6.95	7.13	6.85	7.4	9.9
9	10.8	7.95	8.0	9.1	7.75	7.8	.....	6.71	7.43	6.92	7.3	9.1
10	10.1	8.0	9.4	9.0	7.7	7.8	7.48	6.68	7.28	6.92	11.1	8.8
11	9.8	7.9	9.6	9.8	7.55	7.8	7.35	6.91	6.98	6.88	9.3	8.5
12	10.4	8.1	9.1	11.3	7.9	7.7	7.08	6.85	6.78	6.52	8.7	8.6
13	9.9	7.8	9.1	10.5	7.7	7.6	7.35	6.83	6.85	7.38	8.4	8.5
14	9.4	7.8	11.2	10.5	7.6	7.17	7.43	6.91	6.38	7.7	8.3	8.7
15	9.2	7.9	12.3	10.0	7.5	7.25	7.35	7.21	6.65	6.98	8.4	8.6
16	9.2	7.9	11.6	9.7	7.75	7.5	7.01	6.78	6.95	7.05	8.15	8.45
17	9.8	8.0	10.2	9.5	7.7	7.5	6.98	7.75	6.83	6.90	8.25	8.4
18	11.4	7.8	9.5	9.3	7.65	7.35	6.91	6.73	6.91	6.85	8.0	8.4
19	11.3	7.85	9.4	9.2	7.8	7.40	7.05	6.91	6.93	6.55	8.0	8.3
20	10.2	7.8	9.8	9.0	7.7	7.7	6.83	6.83	6.83	7.15	8.7	8.15
21	11.0	7.95	10.5	8.9	7.7	7.7	7.03	6.88	6.58	8.1	8.8	8.0
22	10.2	8.5	11.0	8.7	7.8	7.38	7.08	6.78	6.93	7.8	8.5	8.3
23	9.8	9.8	9.8	8.7	8.8	7.6	7.03	6.75	7.95	7.8	8.2	8.0
24	10.2	8.55	10.0	8.5	9.8	7.32	7.01	6.75	7.75	7.55	8.4	8.1
25	9.7	8.15	10.2	8.4	9.1	7.28	7.05	6.83	7.42	7.8	8.2	8.0
26	9.4	7.9	12.6	8.4	8.6	7.28	6.98	6.88	7.28	8.9	8.2	8.2
27	9.5	8.0	14.8	8.25	8.35	7.30	6.71	7.05	6.85	10.5	7.8	7.8
28	9.2	10.8	13.7	8.4	8.5	7.17	6.98	6.85	6.68	9.1	8.4	7.7
29	8.9	.....	12.0	8.8	10.4	6.95	7.5	6.78	6.85	8.6	8.1	8.2
30	8.9	.....	11.0	8.6	9.4	7.05	7.35	6.81	7.12	8.3	8.05	8.05
31	8.8	.....	10.8	.....	9.0	.....	7.43	6.91	.....	8.05	.....	8.0

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Daily discharge, in second-feet, of Hoosic River near Eagle Bridge, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,820	2,000	1,730	3,840	810	960	270	189	72	112	620	745
2	1,560	950	1,240	2,570	650	950	195	128	50	116	378	590
3	1,910	1,020	950	2,180	620	745	160	72	57	140	478	560
4	2,990	1,020	950	2,000	620	712	121	174	142	140	505	450
5	1,730	778	810	2,090	560	590	140	118	148	98	355	620
6	1,730	712	745	1,820	620	478	165	160	142	189	355	560
7	2,880	650	478	1,730	560	450	180	128	90	135	310	560
8	4,720	650	560	1,560	450	450	195	128	174	105	270	2,000
9	2,880	532	560	1,320	425	450	230	77	282	121	230	1,320
10	2,180	560	1,560	1,240	400	450	302	72	223	121	3,220	1,090
11	1,910	505	1,730	1,910	332	478	250	118	135	112	1,480	1,090
12	2,470	620	1,320	3,460	505	400	160	105	90	48	1,020	950
13	2,000	450	1,320	2,570	400	355	250	101	105	262	810	880
14	1,560	450	3,340	2,570	355	186	282	118	80	400	745	1,020
15	1,400	505	4,880	2,090	310	212	250	198	68	135	810	950
16	1,400	505	3,840	1,820	425	310	142	90	128	152	650	845
17	1,910	560	2,280	1,640	400	310	135	84	101	116	712	810
18	3,580	450	1,640	1,480	378	250	118	81	118	105	560	810
19	3,460	478	1,560	1,400	450	270	152	118	123	52	560	745
20	2,280	450	1,910	1,240	400	400	101	101	101	180	1,020	650
21	3,100	532	2,570	1,160	400	400	148	112	57	620	1,090	560
22	2,280	880	3,100	1,020	450	262	160	90	123	450	880	745
23	1,910	1,910	1,910	1,020	1,090	355	148	84	532	450	680	560
24	2,280	915	2,090	880	1,910	238	142	84	425	332	810	620
25	1,820	650	2,280	810	1,320	223	152	101	278	450	680	560
26	1,560	505	5,370	810	950	223	135	112	223	1,160	680	680
27	1,640	560	10,000	710	810	230	77	152	105	2,570	450	450
28	1,400	2,880	7,200	810	880	186	135	105	72	1,320	810	400
29	1,160	.....	4,410	1,090	2,470	128	310	90	72	950	620	680
30	1,160	.....	3,100	950	1,560	152	250	96	171	745	590	590
31	1,090	.....	2,880	.....	1,240	.....	282	118	.....	590	.....	560

NOTE.—Discharge determined from a rating curve well defined between 200 and 6,000 second-feet and fairly well defined below 200 second-feet.

Monthly discharge of Hoosic River near Eagle Bridge, N. Y., for 1913.

[Drainage area, 512 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	4,720	1,090	2,120	4.14	4.77	A.
February	2,880	450	810	1.58	1.64	A.
March	10,000	478	2,530	4.94	5.70	B.
April	3,840	710	1,660	3.24	3.62	A.
May	2,470	310	734	1.43	1.65	A.
June	950	128	393	.767	.86	B.
July	282	77	185	.361	.42	B.
August	198	72	113	.221	.25	B.
September	532	30	148	.289	.32	B.
October	2,570	48	402	.785	.90	B.
November	1,480	230	746	1.46	1.63	A.
December	2,000	400	763	1.49	1.72	A.
The year	10,000	30	886	1.73	23.48	

MOHAWK RIVER AT TRIBES HILL, N. Y.

Location.—At the suspension bridge between the towns of Fort Hunter and Tribes Hill.

Records available.—January 1 to December 31, 1912, and discharge measurements in 1913. Data for April 3, 1904, to December 31, 1913, published in annual reports of the New York State engineer and surveyor.

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Drainage area.—3,113 square miles.

Gage.—Chain on bridge.

Discharge measurements.—Made from the downstream side of the suspension bridge.

Cooperation.—Results prior to 1913 furnished by the New York State engineer and surveyor. Station flooded out during June, 1913, by the closing of one of the movable dams of the Barge canal, a short distance below the station.

Discharge measurements of Mohawk River at Tribes Hill, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 24	C. S. De Golyer	7.70	12,800	May 3	R. S. Barnes	5.72	4,340
24	do	7.62	12,300	10	do	5.00	2,340
28	C. C. Covert	15.04	75,900	June 12	C. C. Covert	4.48	1,400
Apr. 24	C. S. De Golyer	5.93	4,590	19	O. W. Hartwell	4.40	1,030

MOHAWK RIVER AT VISCHER FERRY, N. Y.

Location.—At Vischer Ferry, just below Stony Creek, about a mile below the Vischer Ferry dam of the Barge canal, and about 10 miles above the mouth.

Records available.—June 24 to December 31, 1913.

Drainage area.—3,420 square miles.

Gage.—An inclined staff at the foot of an old bridge abutment, about 100 feet above the ferry; a portable automatic gage used July 15 to 28 and August 7 to September 17, 1913.

Channel and control.—Coarse gravel; practically permanent.

Discharge measurements.—Made by wading at the control.

Diversions.—Water is diverted into Erie canal at Vischer Ferry dam and carried around the gage. Miscellaneous measurements of this diversion have been made and are given below, but no allowance for this diversion has been made in computing the flow at Vischer Ferry.

Regulation.—Flow affected by operation of dams upstream.

Accuracy.—Results good.

Discharge measurements of Mohawk River at Vischer Ferry, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 2	G. J. Lyon	3.15	1,570	Sept. 11	Lyon and Barnes	2.85	500
16	Lyon and Easterly	2.98	954	Nov. 5	De Golyer and Barnes	3.40	2,000
Aug. 7	Lyon and Barnes	2.86	668	7	do	3.51	2,200
Sept. 5	De Golyer and Barnes	2.64	315	18	Canfield and Barnes	4.20	4,420

Discharge measurements of Erie Canal at Vischer Ferry, N. Y., for 1913.

Date.	Made by—	Gage height.[a]	Discharge.	Date.	Made by—	Gage height.[a]	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
July 8	W. S. Easterly	2.35	415	Oct. 15	C. S. De Golyer	1.42	220
15	do	2.10	384	Nov. 5	R. S. Barnes	3.27	300
Sept. 11	R. S. Barnes	1.76	385	7	do	3.58	270
Oct. 15	C. S. De Golyer	1.46	366	18	do	1.29	354

[a] Distance to water surface from a reference point on bridge.

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Daily gage height, in feet, of Mohawk River at Vischer Ferry, N. Y., for 1913.

[Wm. Woodin, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.18	2.83	2.79	3.02	3.5	3.75
2	.....	3.12	2.90	2.74	2.98	3.55	4.3
3	.....	3.10	2.84	2.77	3.00	3.40	4.4
4	.....	2.98	2.89	2.75	3.10	3.44	4.2
5	.....	2.98	2.94	2.65	3.46	3.36	3.85
6	.....	3.02	2.90	2.75	3.35	3.28	3.65
7	.....	2.92	2.84	2.74	3.22	3.5	5.0
8	.....	2.96	2.81	2.76	3.22	3.24	4.9
9	.....	2.97	2.80	2.70	2.89	3.5	5.8
10	.....	3.00	2.95	2.75	3.05	12.2	4.5
11	.....	2.91	2.87	2.82	2.95	10.0	4.5
12	.....	2.87	2.84	2.80	2.89	7.0	4.1
13	.....	2.86	2.82	2.78	2.98	5.6	4.2
14	.....	2.78	2.81	2.74	2.99	5.0	4.2
15	.....	2.88	2.83	2.73	2.91	5.1	4.8
16	.....	3.00	2.86	2.96	2.92	4.8	4.4
17	.....	2.96	2.84	2.83	2.97	4.4	4.5
18	.....	2.91	2.85	.....	2.96	4.1	3.95
19	.....	2.90	2.72	.....	2.94	4.1	3.9
20	.....	.....	2.79	2.75	2.98	4.5	3.55
21	.....	2.88	2.83	2.69	3.13	6.1	3.5
22	.....	2.88	2.80	2.85	5.5	5.7	3.55
23	.....	2.88	2.87	2.74	4.8	5.1	3.48
24	3.05	2.91	2.77	3.35	4.4	4.4	3.42
25	2.88	2.90	2.79	3.19	3.9	4.1	3.6
26	3.25	2.89	2.81	2.92	4.0	4.4	3.45
27	3.00	2.88	2.83	2.91	4.8	4.0	3.75
28	2.90	.....	2.81	3.12	5.1	3.9	.....
29	3.30	2.82	2.87	2.68	4.3	3.8	.....
30	3.28	2.84	2.84	2.63	4.2	3.6	.....
31	.....	2.84	2.81	.....	4.1	.....	.....

Daily discharge, in second-feet, of Mohawk River at Vischer Ferry, N. Y., for 1913.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,370	611	540	986	2,230	2,980
2	.....	1,220	740	462	900	2,380	4,760
3	.....	1,170	630	509	940	1,950	5,110
4	.....	900	722	478	1,170	2,060	4,420
5	.....	900	820	331	2,120	1,840	3,280
6	.....	986	740	478	1,820	1,630	2,670
7	.....	780	630	462	1,470	2,230	7,380
8	.....	860	574	494	1,470	1,520	6,980
9	.....	880	556	400	722	2,230	10,700
10	.....	940	840	478	1,060	.....	5,470
11	.....	760	685	593	840	.....	5,470
12	.....	685	630	556	722	.....	4,090
13	.....	666	593	525	900	9,840	4,420
14	.....	525	574	462	920	7,380	4,420
15	.....	703	611	447	760	7,780	6,590
16	.....	940	666	860	780	6,590	5,110
17	.....	860	630	611	880	5,110	5,470
18	.....	760	648	560	860	4,090	3,600
19	.....	740	431	520	820	4,090	3,440
20	.....	722	540	478	900	5,470	2,380
21	.....	703	611	386	1,240	12,000	2,230
22	.....	703	556	648	9,420	10,300	2,380
23	.....	703	685	462	6,590	7,780	2,170
24	1,060	760	509	1,820	5,110	5,110	2,010
25	703	740	540	1,400	3,440	4,090	2,520
26	1,550	722	574	780	3,760	5,120	2,090
27	940	703	611	760	6,590	3,760	1,410
28	740	648	574	1,220	7,780	3,440	1,260
29	1,680	593	685	372	4,760	3,130	1,810
30	1,630	630	630	303	4,420	2,520	1,900
31	.....	630	574	.....	4,090	.....	2,140

NOTE.—Discharge determined from a rating curve well defined below 6,000 second-feet. Discharge estimated for days when no gage height was reported. Mean discharge Nov. 10–12 estimated 52,200 second-feet from an extension of the rating curve.

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Monthly discharge of Mohawk River at Vischer Ferry, N. Y., for 1913.

Month.	Discharge in second-feet.			Accuracy.
	Maximum.	Minimum.	Mean.	
June 24–30	.....	.....	1,190	A.
July	1,370	525	803	A.
August	820	431	626	A.
September	1,820	303	613	B.
October	9,420	722	2,520	B.
November	.....	1,520	9,410	C.
December	10,700	1,260	3,890	B.

WEST CANADA CREEK AT WILMURT, N. Y.

Location.—At the highway bridge in the town of Wilmurt.

Records available.—January 1, 1912, to December 31, 1913. Data for June 28, 1909, to December 31, 1913, published in annual reports of the New York State engineer and surveyor.

Drainage area.—198 square miles.

Gage.—Vertical staff on the downstream side of the center pier of the highway bridge.

Discharge measurements.—Made from the bridge or by wading.

Cooperation.—Results furnished by the New York State engineer and surveyor.

Daily discharge, in second-feet, of West Canada Creek at Wilmurt, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,150	958	676	.....	.....	1,050	138	72	72	98	570	476
2	820	1,000	676	3,520	.....	1,200	118	58	58	325	508	540
3	1,200	1,000	676	1,740	.....	868	98	58	50	570	443	600
4	1,404	916	744	1,870	.....	710	98	72	58	476	508	600
5	1,510	820	744	.....	.....	638	72	72	58	325	710	676
6	1,685	820	744	.....	.....	540	72	72	58	215	570	868
7	3,200	744	744	.....	.....	476	72	58	58	190	476	1,000
8	.....	676	1,300	.....	.....	443	72	58	58	190	410	1,500
9	.....	676	1,404	3,120	.....	410	72	58	58	190	.....	1,457
10	2,490	676	1,404	2,635	.....	356	72	58	58	164	.....	1,230
11	1,740	676	1,510	2,490	.....	356	267	58	50	138	3,040	1,000
12	1,510	676	2,870	2,060	.....	267	164	58	50	138	1,740	868
13	2 270	638	.....	1,805	.....	190	164	58	50	138	1,404	744
14	1,740	676	.....	1,570	.....	356	118	50	50	118	1,457	744
15	1,870	744	.....	1,352	.....	356	98	50	50	98	1,250	600
16	1,935	744	.....	1,250	.....	325	72	50	50	98	1,050	600
17	2,790	744	.....	1,150	.....	267	72	50	50	98	868	600
18	.....	744	.....	958	.....	215	72	50	50	98	710	540
19	.....	676	.....	1,352	.....	190	72	50	50	98	710	540
20	.....	676	.....	1,300	.....	325	72	50	58	744	.....	476
21	.....	676	.....	1,100	.....	215	72	50	58	3,280	2,270	476
22	.....	676	.....	958	.....	190	72	85	1,000	1,740	1,740	476
23	.....	676	.....	820	.....	190	72	215	443	1,100	1,352	476
24	3,360	676	.....	782	1,935	190	190	138	267	916	1,200	476
25	1,805	676	.....	1,250	1,300	138	138	72	190	1,570	1,100	508
26	1,300	676	.....	1,050	958	164	98	58	118	1,685	782	570
27	1,100	676	.....	868	820	164	98	72	98	1,740	638	508
28	916	676	.....	958	3,440	138	98	72	98	1,352	540	352
29	868	.....	.....	1,150	.....	190	98	72	98	1,050	570	352
30	820	.....	.....	1,250	2,060	164	85	72	98	868	508	164
31	744	.....	.....	.....	1,404	.....	72	72	.....	710	.....	98

NOTE.—Discharge beyond the limits of the rating curve for days when no discharge is given.

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Monthly discharge of West Canada Creek at Wilmurt, N. Y., for 1913.

[Drainage area, 198 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January		820	1,662	8.39	9.67
February	1,000	676	739	3.73	3.88
March		676			
April		782	1,534	7.75	8.65
May		820			
June	1,200	138	376	1.90	2.12
July	267	72	102	.515	.594
August	215	50	69	.348	.401
September	1,000	50	119	.601	.671
October	3,280	98	662	3.34	3.85
November		410	1,005	5.08	5.67
December	1,870	98	660	3.33	3.84

WEST CANADA CREEK AT POLAND, N. Y.

Location.—At the highway bridge below the village of Poland.

Records available.—January 1 to December 31, 1913. Data for July 3, 1908, to December 31, 1913, published in annual reports of the New York State engineer and surveyor.

Drainage area.—470 square miles.

Gage.—Standard chain on the downstream side of the bridge.

Discharge measurements.—Made from the bridge.

Cooperation.—Results furnished by the New York State engineer and surveyor.

Daily discharge, in second-feet, of West Canada Creek at Poland, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,660	1,032	684	3,650	950	1,343	332	380	263	240	848	916
2	1,155	991	620	3,150	1,032	1,390	263	286	120	286	748	1,032
3	2,134	991	652	2,428	916	1,114	332	309	220	916	780	882
4	3,806	916	620	2,584	780	916	263	380	220	712	780	916
5	3,320	652	564	5,705	684	780	286	355	220	480	882	950
6	2,904	684	564	4,312	620	684	263	286	220	355	780	916
7	3,887	592	592	2,822	1,249	620	355	240	200	355	652	1,343
8	6,532	652	536	1,920	592	620	309	263	240	309	620	3,968
9	5,810	684	536	1,660	536	564	332	309	200	355	3,806	2,350
10	3,887	712	684	1,343	430	508	592	180	200	309	8,500	1,855
11	2,904	712	848	2,662	455	508	455	309	200	286	4,975	1,343
12	3,575	712	1,032	3,490	455	480	455	286	200	240	2,986	1,032
13	3,068	652	1,390	2,584	405	430	430	220	180	355	2,062	1,073
14	2,506	620	4,138	1,855	380	332	405	220	140	380	1,855	1,032
15	2,062	652	6,440	1,920	380	332	332	220	180	332	1,725	991
16	1,660	620	8,500	1,660	405	405	286	160	200	309	1,552	814
17	4,138	652	7,768	1,444	380	455	332	220	200	309	1,202	950
18	6,935	652	2,904	1,114	455	405	309	220	200	286	1,032	780
19	8,625	620	2,350	1,606	536	380	286	220	240	240	950	652
20	5,400	592	3,320	1,660	455	380	263	200	200	405	3,806	652
21	8,000	684	5,190	1,249	455	455	309	200	160	4,138	4,312	780
22	6,118	848	9,418	1,114	536	430	355	240	508	2,740	2,822	684
23	3,806	1,286	5,910	1,114	2,428	455	332	332	882	1,552	1,855	712
24	4,225	1,202	3,968	1,032	2,904	332	380	332	480	1,296	1,498	536
25	3,068	1,343	11,075	1,444	1,855	332	430	309	430	1,790	1,498	620
26	2,134	991	17,020	1,155	1,249	405	309	309	332	2,062	1,155	620
27	2,206	748	17,270	1,155	1,343	508	240	220	332	2,134	950	620
28	1,390	684	14,480	991	2,584	592	405	263	200	1,725	848	536
29	916	.....	7,250	1,114	6,625	380	380	355	309	1,202	814	562
30	1,032	.....	4,138	1,202	3,150	309	405	332	240	991	882	652
31	1,032	.....	3,320	.....	1,855	.....	380	286	.....	882	.....	592

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Monthly discharge of West Canada Creek at Poland, N. Y., for 1913.

[Drainage area, 470 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	8,625	916	3,545	7.54	8.69
February	1,343	592	792	1.68	1.75
March	17,270	536	4,638	9.86	11.37
April	3,650	991	2,038	4.34	4.84
May	2,904	380	1,196	2.54	2.93
June	1,343	309	562	1.19	1.33
July	592	240	348	.740	.853
August	380	160	272	.579	.668
September	882	120	264	.562	.627
October	4,138	240	902	1.92	2.21
November	8,500	620	1,906	4.06	4.53
December	3,968	536	1,015	2.16	2.49
The year	17,270	120	1,460	3.11	42.288

WEST CANADA CREEK AT KAST BRIDGE, N. Y.

Location.—At the highway bridge about 3 miles above Herkimer, and about 4 miles above the mouth.

Records available.—May 15, 1905, to December 31, 1910; January 1, 1912, to December 31, 1913. Data for May 15, 1905, to December 31, 1913, published in the annual reports of the New York State engineer and surveyor.

Drainage area.—570 square miles.

Gage.—Horton tape gage on bridge near east abutment.

Channel.—Small bowlders and coarse gravel; practically permanent.

Discharge measurements.—Made from the bridge.

Cooperation.—Results furnished by the New York State engineer and surveyor.

Daily discharge, in second-feet, of West Canada Creek at Kast Bridge, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,050	1,385	797	6,160	1,070	1,980	285	366	252	230	942	985
2	1,560	1,070	708	4,242	1,120	1,560	304	290	138	351	730	1,222
3	2,326	1,095	628	3,029	968	1,248	309	257	165	866	767	998
4	4,676	1,070	760	2,970	811	968	267	276	230	737	767	968
5	3,648	774	636	6,160	730	797	197	323	143	511	891	1,140
6	5,516	745	606	5,280	701	708	370	267	170	442	723	980
7	5,748	636	533	3,501	577	737	197	197	204	446	752	1,455
8	7,609	708	621	2,326	687	643	361	248	138	262	701	4,394
9	6,706	658	584	1,700	621	548	219	299	173	356	4,180	2,532
10	4,180	737	1,172	1,490	475	504	366	223	194	309	9,068	2,269
11	3,265	730	1,248	3,808	456	475	489	182	162	309	6,100	1,460
12	4,676	752	1,700	4,552	461	456	456	238	100	465	3,560	1,197
13	3,442	723	1,980	3,324	418	342	409	267	136	418	2,418	1,265
14	2,786	680	7,147	2,188	446	380	380	208	136	394	2,096	1,197
15	2,142	701	7,276	2,418	351	257	257	167	104	338	2,096	1,248
16	1,875	723	8,998	1,910	456	370	252	200	182	267	1,805	985
17	7,476	665	5,922	1,805	437	428	215	130	170	295	1,350	1,044
18	8,015	621	3,324	1,248	451	380	276	165	138	267	1,172	1,070
19	8,575	606	2,786	2,050	591	304	248	194	230	328	1,070	994
20	6,160	658	2,786	1,910	504	370	230	176	230	614	4,304	981
21	8,365	767	5,922	1,490	451	497	230	170	295	4,676	5,160	994
22	7,084	891	9,354	1,274	606	446	248	154	636	3,206	3,147	752
23	4,552	1,980	6,220	1,350	2,418	418	271	280	993	1,700	2,096	951
24	4,800	1,350	5,280	1,248	3,206	314	342	351	606	1,140	1,770	636
25	3,684	1,140	14,377	1,350	2,464	323	428	295	409	1,840	1,630	730
26	2,556	942	20,500	1,274	1,324	295	356	219	342	2,418	1,274	733
27	2,740	789	20,500	1,420	1,630	446	295	276	356	2,326	1,095	659
28	1,735	847	18,355	1,120	2,464	570	304	257	252	1,770	942	441
29	1,172	.....	8,295	1,274	6,706	465	323	394	165	1,248	942	659
30	1,140	.....	4,920	2,924	3,684	314	361	267	262	1,120	968	581
31	1,197	.....	6,520	.....	2,188	.....	361	238	.....	968	.....	659

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Monthly discharge of West Canada Creek at East Bridge, N. Y., for 1913.

[Drainage area, 575 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	8,575	1,140	4,242	7.38	8.51
February	1,980	606	874	1.52	1.58
March	20,500	533	5,498	9.56	11.02
April	6,160	1,120	2,560	4.45	4.96
May	6,706	351	1,273	2.22	2.56
June	1,980	257	585	1.02	1.14
July	489	197	310	.539	.622
August	394	130	244	.424	.489
September	993	100	252	.438	.489
October	4,676	230	988	1.72	1.98
November	9,068	701	2,150	3.74	4.17
December	4,304	409	1,124	1.95	2.25
The year	20,500	100	1,680	2.92	39.770

SCHOHARIE CREEK AT PRATTSVILLE, N. Y.

Location.—At the highway bridge at Prattsville.

Records available.—November 7, 1902, to December 31, 1913.

Drainage area.—236 square miles (revised).

Gage.—Chain gage on upstream side of highway bridge. An auxiliary vertical staff gage about 500 feet below the bridge used during the winter.

Discharge measurements.—Made from the bridge or by wading.

Winter flow.—Not seriously affected by ice.

Regulation.—Flow not seriously affected by storage.

Floods.—The maximum rate of flow occurred at 4.45 p. m., March 27, 1913. Discharge 16,500 second-feet or 70 second-feet per square mile.

Cooperation.—Results furnished by Board of Water Supply of the city of New York.

Daily discharge, in second-feet, of Schoharie Creek at Prattsville, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	774	385	662	1,360	782	391	55	9	25	71	421	546
2	567	361	481	906	616	361	51	9	22	385	361	511
3	1,890	361	463	830	490	301	47	5	19	421	313	483
4	1,976	349	361	702	409	483	37	17	19	289	295	457
5	1,230	331	313	933	361	349	39	15	17	207	237	445
6	1,070	325	277	694	331	252	43	15	15	167	237	421
7	1,170	307	252	623	325	227	47	136	15	143	227	497
8	4,618	331	421	553	277	191	45	55	31	127	195	862
9	1,868	289	494	497	212	171	39	39	19	130	10,916	750
10	1,290	207	331	433	203	151	43	35	13	118	5,050	609
11	1,230	183	630	718	191	133	37	35	11	112	2,298	497
12	1,592	159	397	1,050	171	127	35	23	9	159	1,568	464
13	822	133	313	822	163	118	37	19	11	247	1,230	464
14	662	121	1,748	846	151	97	47	31	9	175	1,070	457
15	630	100	1,580	686	143	103	35	19	11	159	915	445
16	581	163	1,310	595	151	73	29	19	15	151	862	385
17	1,090	143	814	525	133	73	27	19	7	136	806	391
18	1,090	127	623	457	143	88	29	118	11	115	774	397
19	990	112	581	427	127	53	31	47	11	112	846	391
20	766	112	766	415	112	59	29	35	9	1,544	1,050	433
21	1,200	183	1,230	361	112	63	23	39	11	1,628	806	307
22	702	337	1,230	301	118	53	25	35	990	838	718	313
23	638	445	766	289	203	53	25	39	464	574	670	325
24	870	183	1,140	277	970	49	25	37	242	470	623	337
25	638	242	1,010	252	525	43	25	35	163	870	595	325
26	567	127	5,350	212	385	151	19	23	124	1,868	588	373
27	581	163	11,056	191	331	73	19	19	112	1,592	511	511
28	470	457	3,726	1,496	497	69	23	19	85	1,030	470	525
29	409	.....	2,102	1,748	1,010	82	19	43	82	774	694	313
30	415	.....	1,520	1,060	638	53	17	39	71	616	646	203
31	391	.....	1,520	.....	483	.....	11	29	.....	504	.....	183

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Monthly discharge of Schoharie Creek at Prattsville, N. Y., for 1913.

[Drainage area, 236 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in million gallons.
January	4,618	391	1,057	4.48	5.165	21,133
February	457	100	241	1.02	1.064	4,351
March	11,056	252	1,402	5.94	6.851	28,022
April	1,748	191	675	2.86	3.192	13,094
May	1,010	112	347	1.47	1.698	6,953
June	483	43	150	.64	.709	2,904
July	55	11	33	.14	.163	654
August	136	5	34	.14	.169	694
September	990	7	88	.37	.416	1,707
October	1,868	71	507	2.15	2.478	10,108
November	10,916	195	1,200	5.08	5.671	23,253
December	862	183	439	1.86	2.143	8,802
The year	11,056	5	514	2.18	29.719	121,855

ALPLAUS KILL NEAR CHARLTON, N. Y.

Location.—At the highway bridge about half a mile southwest of Charlton.

Records available.—August 12 to December 31, 1913.

Drainage area.—24.9 square miles.

Gage.—Automatic gage referred to a vertical staff on the upstream corner of the left abutment of the bridge.

Channel and control.—A low weir 43 feet long has been constructed between the abutments of the bridge. The average height of its crest is 2.6 feet above the bed of the stream. The crest of the weir is formed by a steel plate having a rectangular notch 36 inches long and 9 inches deep and a V notch in the center of the rectangular notch.

Discharge measurements.—Made from the bridge or by wading. The V notch has been rated by a number of volumetric measurements.

Accuracy.—Results good.

Discharge measurements of Alplaus Kill near Charlton, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 18	Covert and Hartwell	10.444	0.174	Oct. 18	Covert and Hartwell	10.305	0.0895
18	.....do	10.440	.174	18	.....do	10.307	.0707
18	.....do	10.403	.141	18	.....do	10.287	.0580
18	.....do	10.402	.139	18	.....do	10.272	.0511
18	.....do	10.367	.112	18	.....do	10.276	.0530
18	.....do	10.368	.115	Dec. 16	C. S. De Golyer	11.44	18.9
18	.....do	10.342	.0923	31	R. S. Barnes	11.42	18.7
18	.....do	10.343	.0937	31	.....do	11.42	18.8
18	.....do	10.336	.0885				

NOTE.—Measurements of Oct. 18 are volumetric.

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Daily gage height, in feet, and discharge, in second-feet, of Alplaus Kill near Charlton, N. Y., for 1913.

[Edwin Litts, observer.]

Day.	August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	10.29	0.060	10.48	0.327	10.82	2.75	11.50	27.3
2	.....	.....	10.22	.029	10.59	.916	10.62	1.12	11.53	30.8
3	.....	.....	10.15	.011	10.76	2.21	10.61	1.05	11.46	22.9
4	.....	.....	10.08	.002	10.60	.980	10.95	4.04	11.41	18.0
5	.....	.....	10.03	.000	10.51	.460	10.66	1.40	11.36	14.0
6	.....	.....	9.98	.000	10.50	.413	10.92	3.74	11.31	10.7
7	.....	.....	9.92	.000	10.52	.510	10.72	1.88	11.44	20.9
8	.....	.....	9.86	.000	10.49	.369	10.80	2.57	11.64	45.2
9	.....	.....	9.78	.000	10.54	.616	11.62	42.4	11.41	18.0
10	.....	.....	9.71	.000	10.60	.980	11.78	66.4	11.41	18.0
11	.....	.....	9.65	.000	10.47	.288	11.50	27.3	.....	.....
12	9.36	0.000	9.59	.000	10.41	.149	11.42	18.9	.....	.....
13	9.26	.000	9.53	.000	10.46	.251	11.36	14.0	.....	.....
14	10.32	.078	9.47	.000	10.48	.327	11.40	17.1	.....	.....
15	10.07	.002	9.41	.000	10.51	.460	11.39	16.3	.....	.....
16	9.69	.000	9.36	.000	10.56	.730	11.37	14.7	11.42	18.9
17	9.33	.000	9.32	.000	10.48	.327	11.32	11.3	11.41	18.0
18	9.12	.000	9.32	.000	10.38	.122	11.24	7.41	11.38	15.5
19	.....	.000	9.30	.000	10.37	.114	11.22	7.15	11.17	6.55
20	.....	.000	9.27	.000	.....	.....	11.71	55.5	11.05	5.13
21	8.69	.000	9.24	.000	.....	.....	11.52	29.6	11.03	4.91
22	8.66	.000	10.45	.217	.....	.....	11.45	21.9	11.16	6.43
23	8.90	.000	10.72	1.88	10.96	4.14	11.42	18.9	10.89	3.44
24	8.79	.000	10.63	1.19	10.70	1.71	11.38	15.5	11.00	4.58
25	8.80	.000	10.57	.790	10.84	2.94	11.36	14.0	11.06	5.24
26	8.75	.000	10.49	.369	11.32	11.3	11.26	8.0	11.15	6.31
27	9.14	.000	10.52	.510	11.45	21.9	11.27	8.5	10.91	3.64
28	9.30	.000	10.50	.413	11.29	9.5	11.10	5.72	11.16	6.43
29	9.48	.000	10.48	.327	11.16	6.43	11.06	5.24	11.28	9.00
30	10.26	.045	10.49	.369	11.16	6.43	11.31	10.7	11.34	12.6
31	10.40	.140	.....	.....	10.95	4.04	.....	.....	11.18	6.67

NOTE.—Discharge determined from a well-defined rating curve. Estimates do not include leakage, which was less than 0.01 second-foot. Mean discharge Oct. 20–22 estimated 0.11 second-feet; Dec. 11–15, estimated 18 second-feet.

Monthly discharge of Alplaus Kill near Charlton, N. Y., for 1913.

[Drainage area, 24.9 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
August 12–31	0.140	0.000	0.0132	0.0005	0.00	B.
September	1.88	.000	.206	.008	.01	A.
October	21.9	.....	2.56	.103	.11	A.
November	66.4	1.05	15.2	.613	.68	A.
December	45.2	3.44	14.5	.582	.67	A.

KINDERHOOK CREEK AT ROSSMAN, N. Y.

Location.—At the highway bridge at Rossman, a mile above Claversack Creek and 9 miles by road above Hudson.

Records available.—March 17, 1906, to December 31, 1913.

Drainage area.—331 square miles.

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Gage.—Tape gage on highway bridge.

Channel and control.—Rock and gravel.

Discharge measurements.—Made from highway bridge.

Regulation.—Low-water flow, practically controlled by storage in several small lakes and by the operation of power plants and paper mills above the station.

Winter flow.—Seriously affected by ice.

Special studies.—A portable automatic gage was set up near the regular gage and records were obtained August 3 to 12, and November 30 to December 5, 1912, and May 31 to June 10, 1913. A study of the records from this gage indicates that two gage readings a day give fairly good results for discharges over 100 second-feet.

Floods.—The high water of March 25 to 30, 1913, reached a stage of 33.4 feet March 28, as recorded by the gage observer. The corresponding discharge was 8,780 second-feet, or 26.5 second-feet per square mile.

Accuracy.—Results over 100 second-feet fair.

Daily gage height, in feet, of Kinderhook Creek at Rossman, N. Y., for 1913.

[Lester Allen, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.35	28.0	28.3	29.6	27.16	27.29	26.14	26.58	26.10	26.14	27.02	27.30
2	28.35	27.6	28.05	28.9	27.06	27.20	26.52	26.08	25.98	26.32	26.92	27.32
3	28.6	27.65	27.7	28.45	26.94	27.12	26.49	26.28	25.93	26.26	26.82	27.23
4	29.1	27.5	27.55	28.25	26.84	27.04	26.20	26.18	26.13	26.02	26.70	27.27
5	28.6	27.5	27.5	28.4	26.90	26.92	26.36	26.19	26.47	26.10	26.70	27.26
6	28.8	27.6	27.45	28.35	27.02	26.84	26.20	26.40	26.43	26.52	26.85	27.25
7	28.5	27.48	27.32	28.2	27.01	26.73	26.06	26.12	26.20	26.20	26.62	27.08
8	28.9	27.5	27.24	28.0	27.06	26.65	26.60	26.26	26.18	26.48	26.71	27.32
9	28.8	.....	27.42	27.9	26.94	26.84	26.31	26.04	26.26	26.10	26.48	27.27
10	28.7	.....	27.8	27.75	26.84	26.64	26.34	26.18	26.24	26.23	26.94	27.26
11	28.6	.....	28.0	28.0	26.89	26.70	26.22	26.14	26.12	26.01	27.48	27.23
12	28.6	.....	28.05	28.8	26.77	26.68	26.21	26.48	26.00	26.32	27.38	27.06
13	28.9	.....	27.95	28.9	26.72	26.58	26.18	26.34	26.12	26.08	27.20	27.20
14	28.8	.....	28.5	28.9	26.73	26.56	26.12	26.48	26.01	26.25	27.11	27.31
15	28.7	.....	29.5	28.5	26.57	26.55	26.12	26.64	26.25	26.44	27.38	27.49
16	28.7	.....	29.3	28.3	26.72	26.50	26.28	26.58	26.19	26.80	27.15	27.55
17	28.7	.....	28.8	28.15	26.70	26.65	26.14	26.21	26.12	26.58	27.16	27.28
18	28.6	.....	28.3	27.95	26.81	26.58	26.12	26.21	26.18	26.44	27.28	27.26
19	28.6	.....	28.25	27.8	26.44	26.53	26.23	26.22	26.20	26.10	27.18	27.18
20	28.3	.....	28.15	27.7	26.92	26.62	26.18	26.27	26.06	26.51	27.28	27.05
21	28.7	.....	28.7	27.65	26.75	26.53	26.24	26.43	26.02	26.54	27.55	27.20
22	28.45	.....	28.9	27.55	26.66	26.53	26.16	26.18	26.20	26.62	27.36	27.21
23	28.2	.....	28.4	27.49	26.95	26.74	26.20	26.04	26.40	26.68	27.25	27.05
24	28.15	.....	28.35	27.42	27.7	26.65	26.31	26.24	26.62	26.52	27.27	27.19
25	28.1	.....	28.3	27.40	27.6	26.64	26.59	25.97	26.50	26.66	27.29	27.22
26	27.9	.....	29.7	27.27	27.40	26.61	26.45	26.10	26.47	26.82	27.27	27.22
27	27.8	.....	30.8	27.38	27.32	26.54	26.22	26.12	26.46	28.00	27.22	27.31
28	27.7	29.1	32.7	27.22	27.12	26.51	26.12	26.17	26.03	27.65	27.28	27.30
29	27.6	.....	30.5	27.28	27.6	26.36	26.28	26.19	26.55	27.47	27.23	27.08
30	27.6	.....	29.6	27.24	27.65	26.48	26.06	26.28	26.24	27.32	27.30	27.05
31	27.5	.....	29.4	.....	27.48	.....	26.26	26.12	.....	27.22	.....	27.02

NOTE.—Observations suspended Feb. 9–27 on account of ice.

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Daily discharge, in second-feet, of Kinderhook Creek at Rossman, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,120	826	1,070	2,460	292	354	.....	.....	.....	.....	233	359
2	1,120	534	866	1,640	249	310	.....	.....	.....	.....	195	370
3	1,340	568	602	1,210	202	274	.....	.....	.....	.....	160	325
4	1,860	470	502	1,030	167	241	.....	.....	.....	.....	122	344
5	1,340	470	470	1,160	187	195	.....	.....	.....	.....	122	339
6	1,540	534	441	1,120	233	167	.....	.....	.....	.....	170	334
7	1,250	458	370	988	229	131	.....	.....	.....	.....	100	257
8	1,640	470	330	826	249	108	.....	.....	.....	.....	125	370
9	1,540	.....	424	748	202	167	.....	.....	.....	.....	.....	344
10	1,440	.....	673	638	167	105	.....	.....	.....	.....	202	339
11	1,340	.....	826	826	184	122	.....	.....	.....	.....	458	325
12	1,340	.....	866	1,540	144	116	.....	.....	.....	.....	401	249
13	1,640	.....	787	1,640	128	.....	.....	.....	.....	.....	310	310
14	1,540	.....	1,250	1,640	131	.....	.....	.....	.....	.....	270	264
15	1,440	.....	2,340	1,250	.....	.....	.....	.....	.....	.....	401	464
16	1,440	.....	2,090	1,070	128	.....	.....	.....	.....	153	288	502
17	1,440	.....	1,540	947	122	108	.....	.....	.....	.....	280	349
18	1,340	.....	1,070	787	156	.....	.....	.....	.....	.....	349	339
19	1,340	.....	1,030	673	.....	.....	.....	.....	.....	.....	301	301
20	1,070	.....	947	602	195	100	.....	.....	.....	.....	349	245
21	1,440	.....	1,440	568	138	.....	.....	.....	.....	.....	502	310
22	1,210	.....	1,640	502	111	.....	.....	.....	.....	100	391	315
23	988	.....	1,160	464	206	134	.....	.....	.....	116	334	245
24	947	.....	1,120	424	602	108	.....	.....	.....	.....	344	306
25	906	.....	1,070	412	534	105	.....	.....	.....	111	354	320
26	748	.....	2,590	344	412	.....	.....	.....	.....	160	344	320
27	673	.....	4,200	401	370	.....	.....	.....	.....	826	320	364
28	602	1,860	7,480	320	274	.....	.....	.....	.....	568	349	359
29	534	.....	3,730	349	534	.....	.....	.....	.....	453	325	257
30	534	.....	2,460	340	568	.....	.....	.....	.....	370	359	245
31	470	.....	2,210	.....	458	.....	.....	.....	.....	320	.....	233

NOTE.—Discharge determined from a poorly defined rating curve. On account of diurnal fluctuation, estimates of daily discharge are withheld for all days below 100 second-feet. Mean discharge for February determined by comparison with records of Hoosic River near Eagle Bridge, N. Y. Mean discharge for May, June, and November estimated by applying the rating curve to the mean of two daily readings.

Monthly discharge of Kinderhook Creek at Rossman, N. Y., for 1913.

[Drainage area, 331 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	1,860	470	1,200	3.62	4.17	B.
February	.....	.....	463	1.40	1.46	C.
March	7,480	330	1,540	4.65	5.36	B.
April	2,460	320	897	2.71	3.02	B.
May	602	58	249	.752	.87	C.
June	354	.....	128	.387	.43	D.
November	502	.....	284	.858	.96	C.
December	502	233	326	.985	1.14	C.

ESOPUS CREEK NEAR OLIVEBRIDGE, N. Y.

Location.—At a weir about 1 mile below the Olivebridge post office.
Records available.—October 17, 1906, to December 31, 1913.
Drainage area.—239 square miles.
Gage.—Friez automatic gage, 53 feet upstream from the weir.
Winter flow.—Not affected by ice.

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Regulation.—Flow affected by storage in Ashokan reservoir.

Floods.—Maximum flow for 1913 occurred on November 9 at 8 p. m. and lasted for about 15 minutes. The peak discharge was 26,600 second-feet, or 111 second-feet per square mile.

Cooperation.—Data furnished by Board of Water Supply of the City of New York.

Daily discharge, in second-feet, of Esopus Creek near Olivebridge, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,000	590	483	1,400	956	600	84	33	33	103	759	510
2	874	428	410	1,081	816	532	78	40	33	543	563	453
3	1,825	420	350	967	712	475	72	29	29	583	520	421
4	2,230	428	382	874	640	512	67	26	26	354	484	391
5	1,495	353	382	922	580	428	57	29	33	283	562	521
6	1,204	353	400	798	525	366	57	36	29	219	214	538
7	1,141	287	256	712	467	340	44	139	29	226	163	739
8	3,460	271	278	630	410	319	40	89	29	237	202	1,432
9	2,700	265	350	580	375	296	36	62	26	300	6,562	1,013
10	1,900	194	326	532	333	264	36	62	23	340	12,210	904
11	1,551	182	358	712	312	242	33	57	20	340	3,571	820
12	1,414	169	358	1,011	294	222	36	48	23	363	2,851	671
13	1,093	144	312	922	271	215	53	44	22	461	1,277	641
14	910	162	1,970	922	264	194	40	40	26	367	1,764	539
15	808	182	1,855	808	264	175	36	36	19	367	905	569
16	743	188	1,593	743	271	162	33	36	23	367	1,046	459
17	886	175	1,153	680	264	144	33	36	22	344	949	372
18	934	139	910	620	242	144	36	67	23	344	702	411
19	922	144	830	590	235	133	33	40	21	344	814	355
20	816	175	1,523	525	215	139	29	33	29	838	556	362
21	945	201	1,722	483	201	144	33	29	36	2,120	568	315
22	830	312	1,495	456	194	127	29	26	798	1,367	615	283
23	808	502	1,141	420	301	116	29	36	560	1,069	521	301
24	898	256	1,269	392	600	105	36	33	251	858	636	390
25	798	208	1,141	382	392	105	33	29	183	1,163	527	340
26	725	175	3,710	358	340	94	26	29	120	1,392	536	400
27	693	242	9,580	340	340	89	23	29	144	1,750	456	291
28	620	600	5,300	1,347	785	84	29	26	96	1,438	422	270
29	542	.....	2,720	1,664	1,141	89	44	44	60	1,655	483	248
30	525	.....	1,870	1,165	862	78	36	53	84	812	591	240
31	502	.....	1,621	.....	712	.....	29	40	.....	785	.....	250

NOTE.—Olivebridge dam closed Sept. 9 at 6 p. m. Discharge Sept. 10 to Dec. 31 determined from curves of capacity of Ashokan reservoir and from other sources.

Monthly discharge of Esopus Creek near Olivebridge, N. Y., for 1913.

[Drainage area, 239 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in million gallons.
January	3,460	502	1,155	4.83	5.569	23,130
February	600	139	277	1.16	1.202	5,004
March	9,580	256	1,485	6.21	7.161	29,760
April	1,664	340	768	3.21	3.583	14,886
May	1,141	194	462	1.93	2.229	9,251
June	600	78	231	.97	1.077	4,476
July	84	23	41	.17	.203	824
August	139	26	44	.18	.215	876
September	798	19	95	.40	.445	1,843
October	2,120	103	701	2.93	3.383	14,046
November	12,210	162	1,401	5.86	6.538	27,164
December	1,432	240	498	2.08	2.405	9,985
The year	12,210	19	596	2.49	34.010	141,249

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ESOPUS CREEK AT MOUNT MARION, N. Y.

Location.—At the highway bridge at Pleasant Valley, on the Saugerties road, a mile east of the Mount Marion station on the West Shore Railroad.

Records available.—April 4, 1907, to December 31, 1913.

Drainage area.—368 square miles.[1]

Gage.—Chain on downstream side of bridge.

Channel and control.—Rough and irregular ledge rock; practically permanent.

Discharge measurements.—Made from the bridge or by wading about three-quarters of a mile above the bridge.

Winter flow.—Seriously affected by ice.

Regulation.—Flow not seriously affected by the operation of power plants. Water is stored in Ashokan reservoir above the station.

Accuracy.—Results good.

Cooperation.—Results furnished by the Board of Water Supply of the City of New York.

Daily discharge, in second-feet, of Esopus Creek at Mount Marion, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,887	1,000	1,105	2,700	1,635	1,000	146	80	94	50	1,510	979
2	1,510	675	930	1,995	1,350	888	138	80	87	195	1,280	948
3	2,103	550	750	1,833	1,175	792	138	80	87	375	1,105	900
4	3,982	725	700	1,725	1,021	715	130	80	80	255	965	852
5	2,500	585	675	1,680	912	635	122	74	80	206	870	810
6	1,995	565	675	1,430	840	575	115	74	80	177	765	765
7	1,743	467	615	1,301	765	525	108	247	80	159	600	912
8	5,380	435	535	1,189	715	485	108	222	80	138	255	1,707
9	4,932	455	550	1,049	635	443	108	182	74	255	1,977	1,486
10	3,060	392	600	965	575	403	108	141	68	273	5,700	1,374
11	2,460	312	635	1,035	535	375	101	119	63	303	5,790	1,315
12	2,200	338	685	2,160	485	355	101	108	58	427	5,028	1,091
13	1,770	302	650	1,995	455	325	108	101	58	467	4,600	1,091
14	1,470	273	3,125	1,797	455	303	101	94	48	403	4,150	1,091
15	1,406	286	4,330	1,550	395	288	101	94	38	375	3,478	1,021
16	1,161	410	3,800	1,350	395	265	101	87	25	335	3,086	930
17	1,259	320	2,530	1,175	387	247	94	80	20	318	2,530	900
18	1,510	246	1,905	1,091	355	229	94	80	20	312	1,995	870
19	1,550	211	1,470	1,000	325	222	94	80	20	303	1,815	780
20	1,280	259	2,085	912	303	215	87	74	36	715	1,550	725
21	1,280	302	3,800	828	288	247	87	74	53	1,210	1,374	700
22	1,210	399	3,190	780	303	222	87	74	94	1,035	1,231	675
23	1,105	1,210	2,300	735	403	206	87	87	130	965	1,140	625
24	1,407	685	2,360	685	1,280	187	94	80	111	828	1,049	828
25	1,245	625	2,130	650	1,021	173	94	74	91	2,067	979	840
26	1,091	535	5,970	615	675	191	87	74	87	2,700	912	852
27	1,021	625	13,200	575	625	182	80	68	87	2,480	852	715
28	888	1,119	13,070	1,510	1,210	173	74	63	78	2,604	810	525
29	810	.....	5,700	3,000	2,480	164	87	78	68	2,380	912	525
30	765	.....	3,478	2,040	1,653	155	80	101	58	1,950	1,035	500
31	780	.....	2,880	.....	1,245	.....	80	94	.....	1,680	.....	500

[1] Total drainage area above Mount Marion, 418 square miles. Diverted from Saw Kill for Kingston water supply, 33 square miles. Diverted from Platte Kill for Saugerties water supply, 17 square miles. Net drainage area above Mount Marion, 368 square miles. This net drainage area supersedes the figures formerly published.

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Monthly discharge of Esopus Creek at Mount Marion, N. Y., for 1913.

[Drainage area, 368 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in million gallons.
January	5,380	765	1,833	4.98	5.744	36,727
February	1,210	211	511	1.39	1.445	9,244
March	13,200	535	2,787	7.57	8.736	55,839
April	3,000	575	1,378	3.74	4.181	26,722
May	2,480	288	803	2.18	2.515	16,087
June	1,000	155	373	1.01	1.130	7,226
July	146	74	101	.27	.320	2,049
August	247	63	98	.27	.304	1,971
September	130	20	68	.18	.209	1,337
October	2,700	50	837	2.27	2.626	16,785
November	5,790	255	1,978	5.38	6.000	38,354
December	1,707	500	898	2.44	2.813	17,987
The year	13,200	20	972	2.64	36.023	230,278

RONDOUT CREEK AT ROSENDALE, N. Y.

Location.—At the highway bridge at Rosendale.

Records available.—July 6, 1901, to November 6, 1903; January 1, 1906, to December 31, 1913.

Drainage area.—380 square miles.

Gage.—Chain gage on downstream side of bridge.

Discharge measurements.—Made from the bridge or by wading about 1,000 feet below the bridge.

Winter flow.—Seriously affected by ice. Discharge determined by current-meter measurements.

Diversions.—Part of the water of the creek is diverted at a dam below High Falls through the Delaware & Hudson Canal and is returned to the creek below the gaging station. A record of this diversion is kept and the results for Rondout Creek are corrected.

Regulation.—Flow somewhat affected by storage at Honk Falls, Napanoch, and High Falls.

Cooperation.—Results furnished by the Board of Water Supply of the City of New York.

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Daily discharge, in second-feet, of Rondout Creek at Rosendale, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,560	1,002	1,560	1,904	1,579	728	155	65	71	470	690	770
2	1,200	922	987	1,390	1,140	599	149	233	87	2,152	610	650
3	2,180	850	874	1,230	905	533	138	93	125	998	554	570
4	2,670	770	770	1,200	826	493	131	78	146	717	530	586
5	1,630	714	610	1,370	762	379	123	146	147	556	474	530
6	1,390	578	634	1,090	706	351	107	80	214	371	426	490
7	1,350	898	410	986	619	352	101	579	156	488	426	530
8	7,634	1,090	546	938	570	437	125	298	109	301	394	1,744
9	5,300	746	474	730	521	359	112	181	109	314	9,470	1,155
10	2,240	730	530	722	474	334	94	130	113	293	9,164	961
11	2,108	610	730	986	440	311	85	82	97	270	3,380	885
12	2,168	657	802	3,908	377	292	80	74	68	721	2,216	722
13	1,904	621	666	2,300	351	261	81	106	63	631	1,670	650
14	1,230	441	6,500	2,180	369	238	111	100	72	510	1,330	634
15	1,130	549	3,684	1,510	381	266	94	113	59	359	1,100	610
16	1,230	441	2,908	1,220	365	255	98	94	75	310	986	570
17	1,530	405	1,880	1,090	333	251	91	82	92	456	1,042	530
18	1,400	279	1,380	898	301	235	70	66	94	424	1,170	490
19	1,290	306	1,130	826	291	193	85	102	119	465	1,200	450
20	1,070	306	2,024	707	276	203	79	114	96	1,793	930	410
21	1,230	441	2,670	619	264	340	73	84	94	1,630	810	352
22	1,150	441	2,336	651	318	249	69	99	882	1,130	746	340
23	970	1,660	1,630	590	631	203	72	85	687	794	714	370
24	1,220	1,071	1,690	589	1,522	177	138	61	402	730	714	586
25	1,130	643	1,450	590	1,031	166	99	51	244	3,160	666	666
26	1,010	571	2,168	505	646	166	93	67	202	3,332	634	826
27	938	585	9,812	469	778	166	81	84	164	2,480	514	682
28	850	1,600	8,606	2,465	890	165	85	69	162	1,760	522	666
29	698	.....	3,684	3,868	1,316	160	217	92	161	1,230	890	746
30	714	.....	2,408	2,468	1,227	155	127	205	181	954	930	730
31	690	.....	1,430	.....	936	.....	86	165	.....	826	.....	730

NOTE.—Estimates Apr. 19 to Oct. 18 include amount in Delaware & Hudson Canal. No flow in the canal during balance of year.

Monthly discharge of Rondout Creek at Rosendale, N. Y., for 1913.

[Drainage area, 386 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in million gallons.
January	7,634	690	1,704	4.41	5.083	34,134
February	1,660	279	712	1.84	1.916	12,879
March	9,812	410	2,160	5.60	6.449	43,285
April	3,908	469	1,333	3.45	3.851	25,849
May	1,579	264	682	1.77	2.039	13,667
June	728	155	301	.78	.872	5,828
July	217	69	105	.27	.313	2,100
August	579	51	125	.32	.375	2,507
September	882	59	176	.46	.507	3,420
October	3,332	270	988	2.56	2.949	19,794
November	9,470	394	1,497	3.88	4.324	29,018
December	1,744	340	666	1.73	1.988	13,336
The year	9,812	51	871	2.26	30.666	205,817

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DELAWARE RIVER BASIN.

EAST BRANCH OF DELAWARE RIVER AT FISH EDDY, N. Y.

Location.—At the highway bridge near New York, Ontario & Western Railway station at Fish Eddy, 5½ miles above the confluence of the east and west branches of Delaware River.

Records available.—November 19, 1912, to December 31, 1913. Records were obtained at Hancock, about 4 miles below, from October 14, 1902, to December 31, 1912.

Drainage area.—790 square miles.

Gage.—Vertical staff in two sections.

Channel.—Coarse gravel; practically permanent.

Discharge measurements.—Made from the highway bridge or by wading.

Winter flow.—Somewhat affected by ice.

Floods.—The high water of March 25–30, 1913, reached a stage of 17.4 feet on the afternoon of March 27, as determined from gage height observations and high-water marks. The corresponding discharge was approximately 33,500 second-feet, or 38.5 second-feet per square mile of drainage area.

Accuracy.—Results fair.

Discharge measurements of East Branch of Delaware River at Fish Eddy, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 10	Frank Weber	4.46	1,680	May 9	C. S. De Golyer	3.34	816
12	do	4.30	1,770	July 31	G. H. Canfield	1.78	127
13	do	4.21	1,630	Sept. 16	R. S. Barnes	1.57	75.6
19	do	5.31	2,620	16	do	1.53	73.0
27	do	12.73	19,400	Oct. 28	do	4.37	1,820
31	do	7.27	5,930				

Daily gage height, in feet, of East Branch of Delaware River at Fish Eddy, N. Y., for 1913.

[J. J. Finnegan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.1	5.1	.....	6.8	4.4	4.6	.....	2.2	1.92	2.4	3.5	4.4
2	4.7	.....	.....	5.8	4.3	4.4	.....	2.1	1.84	2.85	3.45	4.4
3	6.0	.....	.....	5.6	4.1	4.0	.....	2.0	1.79	2.85	3.45	4.5
4	8.8	.....	4.6	5.3	3.8	6.4	.....	1.86	1.74	2.55	3.4	4.4
5	7.0	.....	4.4	5.9	3.8	5.2	.....	1.82	1.71	2.5	3.4	4.3
6	6.3	.....	4.2	5.4	3.7	4.6	.....	1.78	1.77	2.4	3.35	4.3
7	7.1	.....	.....	5.1	3.5	4.8	.....	2.15	1.81	2.35	3.35	4.6
8	12.5	.....	.....	4.8	3.45	4.4	.....	2.1	1.84	2.35	3.4	4.5
9	9.9	.....	.....	4.7	3.35	3.8	.....	1.98	1.80	2.3	8.8	4.8
10	7.7	.....	4.4	4.4	3.25	3.6	.....	.....	1.78	2.25	10.1	5.0
11	7.0	.....	4.2	4.6	3.15	3.5	.....	.....	1.74	2.2	7.4	.....
12	7.4	.....	4.4	6.7	3.15	3.4	.....	.....	1.73	2.15	6.8	.....
13	6.7	.....	4.1	5.7	3.05	3.3	.....	.....	1.70	2.15	6.2	.....
14	5.9	.....	7.3	5.6	3.0	3.05	.....	.....	1.69	2.05	5.5	.....
15	5.6	.....	7.9	5.3	2.95	2.95	.....	.....	1.68	2.15	5.0	.....
16	5.4	.....	7.3	5.0	2.9	2.85	.....	.....	1.67	2.3	4.9	.....
17	6.1	.....	6.3	4.8	2.85	2.8	.....	.....	1.66	2.35	4.8	.....
18	6.7	.....	5.5	4.6	2.8	2.75	.....	.....	1.66	2.3	4.8	.....
19	6.8	.....	.....	4.4	2.8	2.65	.....	.....	1.69	2.3	4.7	.....
20	6.5	.....	.....	4.2	2.85	2.8	.....	.....	1.74	3.6	4.7	.....
21	6.8	.....	6.3	4.1	3.05	2.6	.....	.....	1.81	4.7	4.6	.....
22	6.2	.....	6.5	3.9	3.1	2.6	.....	2.65	.....	4.6	4.6	.....
23	5.7	.....	5.8	3.8	3.4	2.55	.....	2.4	.....	4.3	4.6	.....
24	6.0	.....	6.1	3.8	3.7	2.5	.....	2.0	.....	.....	4.8	.....
25	5.6	.....	6.3	3.7	3.7	2.45	.....	1.94	.....	.....	5.0	.....
26	5.2	.....	8.9	3.6	3.6	2.4	1.81	1.88	3.0	.....	4.8	.....
27	5.0	.....	14.9	3.5	3.5	2.35	1.79	1.85	2.6	5.1	4.6	.....
28	4.7	.....	12.7	4.4	5.8	2.3	2.05	1.81	2.45	4.3	4.5	.....
29	4.5	.....	8.9	5.2	5.9	2.3	2.2	2.3	2.35	3.8	4.4	.....
30	4.4	.....	7.4	4.7	5.6	2.25	1.95	2.35	2.35	3.6	4.4	.....
31	4.2	.....	6.8	.....	5.1	.....	1.75	2.05	.....	3.6	.....	.....

NOTE.—Gage-height observations suspended Feb. 2 to Mar. 3 on account of ice.

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Daily discharge, in second-feet, of East Branch of Delaware River at Fish Eddy, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,740	2,740	3,500	5,010	1,850	2,080	.....	256	167	330	950	1,850
2	2,200	.....	3,000	3,820	1,740	1,850	.....	222	145	530	910	1,850
3	4,160	.....	2,600	3,500	1,520	1,420	.....	190	132	530	910	1,960
4	9,250	.....	2,080	2,040	1,220	4,300	.....	150	120	391	870	1,850
5	5,390	.....	1,850	3,990	1,220	2,890	.....	139	112	370	870	1,740
6	4,130	.....	1,630	3,190	1,130	2,080	.....	129	127	330	835	1,740
7	5,580	.....	1,450	2,740	950	2,330	.....	239	137	311	835	2,080
8	18,800	.....	1,300	2,330	910	1,850	.....	222	145	311	870	1,960
9	12,000	.....	1,550	2,200	835	1,220	.....	184	134	292	10,200	2,330
10	6,810	.....	1,850	1,850	765	1,040	.....	160	129	274	13,400	2,600
11	5,390	.....	1,630	2,080	700	950	.....	150	120	256	6,950	.....
12	6,180	.....	1,850	4,830	700	870	.....	140	117	239	5,650	.....
13	4,830	.....	1,520	3,660	640	800	.....	130	110	239	4,500	.....
14	3,990	.....	5,980	3,500	610	640	.....	125	108	206	3,340	.....
15	3,500	.....	7,230	2,040	583	583	.....	120	106	239	2,600	.....
16	3,190	.....	5,980	2,600	556	530	.....	115	103	292	2,470	.....
17	3,810	.....	4,130	2,330	530	504	.....	115	101	311	2,330	.....
18	4,830	.....	3,340	2,080	504	480	.....	110	101	292	2,330	.....
19	5,010	.....	3,040	1,850	504	434	.....	105	108	292	2,200	.....
20	4,470	.....	3,820	1,630	530	504	.....	100	120	1,040	2,200	.....
21	5,010	.....	4,130	1,520	640	412	.....	100	137	2,200	2,080	.....
22	3,970	.....	4,470	1,320	670	412	.....	434	1,630	2,080	2,080	.....
23	3,660	.....	3,820	1,220	870	391	.....	330	1,630	1,740	2,080	.....
24	3,650	.....	3,810	1,220	1,130	370	.....	190	1,470	1,220	2,330	.....
25	3,500	.....	4,130	1,130	1,130	350	.....	173	1,040	1,130	2,600	.....
26	2,890	.....	9,490	1,040	1,040	330	137	156	610	1,320	2,330	.....
27	2,600	.....	25,600	950	950	311	132	148	412	2,740	2,080	.....
28	2,200	.....	19,400	870	3,820	292	206	137	350	1,740	1,960	.....
29	1,960	.....	9,490	2,890	3,990	292	256	292	311	1,220	1,850	.....
30	1,850	.....	6,180	2,200	3,500	274	176	311	311	1,040	1,850	.....
31	1,630	.....	5,010	.....	2,740	.....	122	206	.....	1,040	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Daily discharge Aug. 10-21 and mean discharge for February, July, and December estimated by comparison with records at Hancock and Port Jervis.

Monthly discharge of East Branch of Delaware River at Fish Eddy, N. Y., for 1913.

[Drainage area, 790 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	18,800	1,630	4,810	6.09	7.02	B.
February	.....	.....	870	1.10	1.14	C.
March	25,600	1,300	5,000	6.33	7.30	C.
April	5,010	870	2,390	3.03	3.38	B.
May	3,990	504	1,240	1.57	1.81	B.
June	4,300	274	1,030	1.30	1.45	B.
July	.....	122	186	.235	.27	B.
August	434	.....	180	.228	.26	B.
September	1,630	101	345	.437	.49	B.
October	2,740	206	792	1.00	1.15	C.
November	13,400	835	2,880	3.65	4.07	D.
December	.....	.....	1,730	2.19	2.52	D.
The year	25,600	.....	1,800	2.28	30.86	

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DELAWARE RIVER AT PORT JERVIS, N. Y.

Location.—At the toll bridge at Port Jervis, 1 mile above Neversink River and 6 miles below Mongaup River.

Records available.—October 12, 1904, to December 31, 1913. Data also published in the annual reports of the New York State engineer and surveyor.

Drainage area.—3,250 square miles.

Gage.—Chain on downstream side of bridge.

Channel and control.—Gravel; somewhat shifting.

Discharge measurements.—Made from highway bridge, or by wading.

Winter flow.—Somewhat affected by ice.

Floods.—A gage height of 15 feet was recorded by the observer on March 28, 1913. Later investigations indicate that the crest of the flood reached a stage of 15.5 feet, with a corresponding discharge of 88,400 second-feet, or 27.2 second-feet per square mile.

Accuracy.—Results good.

Cooperation.—Gage heights furnished by the United States Weather Bureau.

Discharge measurements of Delaware River at Port Jervis, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 8	Frank Weber	3.05	2,910	May 13	C. S. De Golyer	2.65	2,620
29	do	9.09	33,000	Aug. 9	G. H. Canfield	1.41	660

Daily gage height, in feet, of Delaware River at Port Jervis, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.5	4.0	7.0	6.6	4.7	4.4	1.5	1.3	1.2	1.4	2.6	3.3
2	4.8	4.1	5.3	6.2	4.4	4.0	1.6	1.3	1.2	1.8	2.3	3.2
3	4.6	4.2	4.4	5.4	4.1	3.6	1.3	1.3	1.2	2.2	2.1	3.1
4	8.0	3.8	4.2	5.4	4.0	3.4	1.4	1.2	1.1	1.6	2.1	3.1
5	7.1	3.4	4.0	5.5	3.7	4.2	1.5	1.1	1.1	1.4	2.1	3.1
6	6.0	3.4	3.8	5.3	3.7	3.9	1.7	1.1	1.1	1.6	2.1	3.0
7	5.6	3.2	3.4	4.9	3.4	3.2	1.5	1.7	1.1	1.6	2.1	3.0
8	5.6	3.0	3.1	4.6	3.3	3.5	1.5	1.2	1.1	1.6	2.1	2.9
9	11.0	3.0	2.7	4.4	3.3	3.2	1.4	1.4	1.1	1.6	2.8	2.9
10	7.8	2.8	3.3	4.1	3.2	2.9	1.4	1.2	1.1	1.6	9.7	3.7
11	6.8	2.9	4.0	4.1	2.8	2.7	1.4	1.5	1.1	1.5	7.3	3.7
12	6.7	3.0	4.5	6.2	2.7	2.6	1.4	1.3	1.1	1.6	6.1	3.4
13	7.4	2.7	4.4	5.2	2.6	2.6	1.4	1.2	1.1	1.8	5.3	3.4
14	7.0	2.7	4.3	5.9	2.6	2.5	1.4	1.2	1.1	1.7	4.7	3.3
15	5.6	2.7	8.0	5.6	2.4	2.3	1.5	1.2	1.1	1.5	4.6	3.4
16	5.3	2.9	7.3	5.2	2.4	2.3	1.4	1.2	1.1	1.5	4.3	3.3
17	5.0	2.9	6.5	4.9	2.4	2.2	1.4	1.2	1.0	1.5	4.1	3.3
18	5.9	2.8	5.7	4.5	2.4	2.3	1.4	1.2	1.0	1.5	3.8	3.2
19	6.3	2.8	5.1	4.4	2.4	2.2	1.3	1.4	1.0	1.5	4.2	3.2
20	6.1	2.7	4.9	4.2	2.4	2.2	1.3	1.3	1.0	1.6	4.0	3.1
21	5.5	2.7	5.9	3.9	2.3	2.2	1.2	1.2	1.0	2.5	3.9	3.1
22	6.2	2.7	5.6	3.7	2.5	2.2	1.2	1.1	1.6	4.0	3.8	2.9
23	5.4	3.2	5.7	3.5	2.5	2.2	1.2	1.2	2.5	3.4	3.5	2.9
24	5.2	3.9	5.2	3.4	3.8	2.2	1.3	1.2	2.7	3.4	3.4	3.1
25	5.4	4.0	5.6	3.0	4.0	2.0	1.3	1.1	2.5	3.6	3.2	3.3
26	5.0	3.4	5.7	3.0	3.8	1.9	1.3	1.1	1.9	3.6	3.1	3.3
27	4.7	3.0	9.3	3.0	3.4	1.8	1.3	1.0	1.7	4.0	3.1	3.1
28	4.5	3.4	15.0	3.5	3.3	1.8	1.2	1.1	1.6	3.4	3.1	3.2
29	4.4	.....	10.0	5.5	4.3	1.7	1.4	1.1	1.5	3.3	3.3	3.2
30	4.0	.....	7.9	5.3	5.8	1.6	1.4	1.4	1.4	3.0	3.4	2.9
31	4.0	.....	6.9	.....	4.7	.....	1.4	1.3	.....	2.8	.....	2.7

NOTE.—Gage read daily at about 8 a. m. Discharge relation Feb. 16–19 possibly affected by ice.

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Daily discharge, in second-feet, of Delaware River at Port Jervis, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	12,100	5,800	20,500	18,000	8,520	7,350	685	525	455	600	2,230	3,830
2	8,930	6,160	11,100	15,700	7,350	5,930	780	525	455	990	1,690	3,570
3	8,100	6,530	7,300	11,600	6,270	4,670	525	525	455	1,530	1,380	3,320
4	27,500	5,100	6,530	11,600	5,930	4,100	600	455	390	780	1,380	3,320
5	21,200	3,860	5,800	12,100	4,970	6,620	685	390	390	600	1,380	3,320
6	14,600	3,860	5,100	11,100	4,970	5,600	880	390	390	780	1,380	3,080
7	12,500	3,320	3,860	9,350	4,100	3,570	685	880	390	780	1,380	3,080
8	12,500	2,860	3,080	8,120	3,830	4,380	685	455	390	780	1,380	5,600
9	50,900	2,860	2,260	7,350	3,830	3,570	600	600	390	780	2,640	5,600
10	26,000	2,450	3,580	6,270	3,570	2,860	600	455	390	780	40,400	4,970
11	19,200	2,650	5,800	6,270	2,640	2,430	600	685	390	685	22,500	4,970
12	18,600	2,860	7,700	15,700	2,430	2,230	600	525	390	780	15,100	4,100
13	23,200	2,260	7,300	10,700	2,230	2,230	600	455	390	990	11,100	4,100
14	20,500	2,260	6,910	14,100	2,230	2,040	600	455	390	880	8,520	3,830
15	12,500	2,260	27,500	12,500	1,860	1,690	685	455	390	685	8,120	4,100
16	11,100	2,260	22,500	10,700	1,860	1,690	600	455	390	685	6,980	3,830
17	9,780	2,260	17,400	9,350	1,860	1,530	600	455	330	685	6,270	3,830
18	14,100	2,260	13,000	7,730	1,860	1,690	600	455	330	685	5,280	3,570
19	16,200	2,260	10,200	7,350	1,860	1,530	525	600	330	685	6,620	3,570
20	15,100	2,260	9,350	6,620	1,860	1,530	525	525	330	780	5,930	3,320
21	12,100	2,260	14,100	5,600	1,690	1,530	455	455	330	2,040	5,600	3,320
22	15,700	2,260	12,500	4,970	2,040	1,530	455	390	780	5,930	5,280	2,860
23	11,600	3,320	13,000	4,380	2,040	1,530	455	455	2,040	4,100	4,380	2,860
24	10,700	5,440	10,700	4,100	5,280	1,530	525	455	2,430	4,100	4,100	3,320
25	11,600	5,800	12,500	3,080	5,930	1,240	525	390	2,040	4,670	3,570	3,830
26	9,780	3,860	13,000	3,080	5,280	1,110	525	390	1,110	4,670	3,320	3,830
27	8,510	2,860	37,300	3,080	4,100	990	525	330	880	5,930	3,320	3,320
28	7,700	3,860	84,000	4,380	3,830	990	455	390	780	4,100	3,320	3,570
29	7,300	.....	42,800	12,100	6,980	880	600	390	685	3,830	3,830	3,570
30	5,800	.....	26,800	11,100	13,500	780	600	600	600	3,080	4,100	2,640
31	5,800	.....	19,800	.....	8,520	.....	600	525	.....	2,640	.....	2,430

NOTE.—Discharge determined from two well-defined rating curves. Discharge Feb. 16–19 interpolated.

Monthly discharge of Delaware River at Port Jervis, N. Y., for 1913.

[Drainage area, 3,250 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	50,900	5,800	14,900	4.58	5.28	B.
February	6,530	2,260	3,430	1.06	1.10	B.
March	84,000	2,260	15,600	4.80	5.53	C.
April	18,000	3,080	8,940	2.75	3.07	B.
May	13,500	1,690	4,300	1.32	1.52	B.
June	7,350	780	2,640	.812	.91	B.
July	880	455	593	.182	.21	B.
August	880	330	485	.149	.17	B.
September	2,430	330	648	.199	.22	B.
October	5,930	600	1,970	.606	.70	B.
November	40,400	1,380	6,420	1.98	2.21	B.
December	5,600	2,430	3,690	1.14	1.31	B.
The year	84,000	330	5,320	1.64	22.23	

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DELAWARE RIVER AT RIEGELSVILLE, N. J.

Location.—At the toll suspension bridge between Riegelsville, N. J., and Riegelsville, Pa., 600 feet above Musconetcong River, and 9 miles below Lehigh River.

Records available.—July 3, 1906, to December 31, 1913.

Drainage area.—6,430 square miles.

Gage.—Chain on bridge.

Channel and control.—Large bowlders; practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Not seriously affected by ice.

Diversions.—250 to 300 second-feet diverted from Lehigh River near its mouth each year from about the last of March to the middle of December by the Delaware division of the Pennsylvania canal. Results at Riegelsville corrected for diversion. (See footnote to monthly discharge table.)

Accuracy.—Results good.

Cooperation.—Results of some of the discharge measurements furnished by engineers of the Water Supply Commission of Pennsylvania.

Discharge measurements of Delaware River at Riegelsville, N. J., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 20	Reckord and Batley	3.73	5,820	Sept. 10	Batchelder and Walters	2.21	[a]1,570
July 25	R. A. Boehringer	2.61	2,380				

[a] Does not include 224 second-feet measured in canal.

Daily gage height, in feet, of Delaware River at Riegelsville, N. J., for 1913.

[John H. Deemer, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.0	5.6	6.0	10.5	8.8	5.8	2.65	2.3	2.35	2.6	4.3	4.9
2	7.7	5.5	7.9	9.8	7.9	5.3	2.65	4.3	2.25	4.1	4.1	4.9
3	7.7	5.2	6.1	8.6	7.2	5.0	2.55	3.1	2.15	3.9	4.0	4.6
4	10.5	5.0	5.6	8.1	6.6	4.7	2.5	2.85	2.1	3.7	3.8	4.5
5	11.8	4.4	5.4	7.8	6.1	4.5	2.45	2.55	2.35	3.4	3.7	4.4
6	9.8	4.5	5.2	7.7	5.9	5.2	2.5	2.4	2.15	3.2	3.6	4.3
7	8.8	4.0	4.8	7.4	5.6	4.6	2.6	2.85	2.1	3.0	3.5	4.4
8	9.4	3.8	4.1	6.8	5.2	4.3	2.55	2.65	2.8	2.95	3.4	5.2
9	16.0	4.0	4.2	6.4	5.0	4.3	2.45	2.55	2.3	2.9	4.6	6.0
10	12.7	4.2	4.3	6.1	4.7	4.2	3.3	2.5	2.2	2.85	11.2	5.9
11	10.5	4.0	5.2	6.0	4.6	3.9	2.65	2.4	2.1	2.8	12.8	5.4
12	9.8	4.0	5.6	9.0	4.5	3.7	2.45	2.35	2.15	3.1	9.5	5.1
13	10.4	3.7	5.6	10.3	4.4	3.6	2.5	2.25	2.15	3.3	7.9	4.9
14	9.4	3.6	7.1	9.6	4.2	3.5	2.8	2.25	2.0	3.1	6.9	4.8
15	7.9	3.8	12.1	9.2	4.1	3.4	2.55	2.2	2.05	3.0	6.5	4.8
16	7.6	3.9	12.4	9.1	4.0	3.4	2.5	2.2	2.05	2.9	6.3	4.7
17	7.5	4.0	10.9	8.2	4.0	3.2	2.4	2.25	1.9	2.8	6.4	4.6
18	7.8	3.8	9.3	7.6	3.9	3.1	2.45	2.35	2.0	2.8	6.0	4.5
19	8.6	3.8	8.2	7.1	3.9	3.0	2.45	2.25	2.0	2.65	5.8	4.3
20	8.5	3.8	8.3	6.7	3.8	3.0	2.35	2.2	2.1	3.1	5.7	4.2
21	7.9	3.9	9.3	6.2	3.7	3.3	2.25	2.25	2.2	4.0	5.6	4.0
22	7.8	4.0	9.3	5.9	3.7	3.3	2.25	2.15	3.8	4.6	5.5	4.1
23	7.7	4.9	8.8	5.7	3.8	3.2	2.2	2.25	3.6	5.0	5.4	4.2
24	7.3	4.5	8.0	5.6	5.4	3.1	2.1	2.25	3.7	4.4	5.1	5.3
25	7.3	4.5	7.9	5.4	6.0	3.0	2.6	2.2	3.6	5.2	4.9	5.2
26	7.1	4.6	8.3	5.2	5.7	2.9	2.5	2.2	3.2	6.4	4.8	6.4
27	6.7	4.4	13.3	5.2	5.1	3.0	2.3	2.15	2.9	6.7	4.6	6.2
28	6.5	6.2	24.4	10.3	5.0	3.1	2.4	2.05	2.6	6.1	4.6	5.5
29	6.1	.....	18.8	11.0	5.3	3.0	2.4	2.15	2.6	5.4	4.6	5.0
30	5.7	.....	13.8	10.2	6.8	2.95	2.4	2.1	2.5	4.9	4.7	4.6
31	5.6	.....	11.6	.....	6.4	.....	2.35	2.2	.....	4.6	.....	4.5

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Daily discharge, in second-feet, of Delaware River at Riegelsville, N. J., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	21,600	11,600	13,100	35,100	25,600	12,400	2,700	2,010	2,100	2,600	7,190	9,160
2	20,200	11,200	21,100	31,000	21,100	10,500	2,700	7,190	1,920	6,560	6,560	9,160
3	20,200	10,200	13,500	24,500	18,000	9,500	2,500	3,750	1,740	5,950	6,250	8,160
4	35,100	9,500	11,600	22,100	15,400	8,490	2,400	3,140	1,660	5,360	5,650	7,830
5	43,100	7,510	10,900	20,700	13,500	7,830	2,300	2,500	2,100	4,530	5,360	7,510
6	31,000	7,830	10,200	20,200	12,700	10,200	2,400	2,200	1,740	4,000	5,080	7,190
7	25,600	6,250	8,820	18,800	11,600	8,160	2,600	3,140	1,660	3,500	4,800	7,510
8	28,800	5,650	6,560	16,300	10,200	7,190	2,500	2,700	3,030	3,380	4,530	10,200
9	72,600	6,250	6,870	14,600	9,500	7,190	2,300	2,500	2,010	3,260	8,160	13,100
10	49,100	6,870	7,190	13,500	8,490	6,870	4,260	2,400	1,830	3,140	39,300	12,700
11	35,100	6,250	10,200	13,100	8,160	5,950	2,700	2,200	1,660	3,030	49,700	10,900
12	31,000	6,250	11,600	26,600	7,830	5,360	2,300	2,100	1,740	3,750	29,300	9,840
13	34,500	5,360	11,600	33,900	7,510	5,080	2,400	1,920	1,740	4,260	21,100	9,160
14	28,800	5,080	17,500	29,900	6,870	4,800	3,030	1,920	1,500	3,750	16,700	8,820
15	21,100	5,650	45,100	27,700	6,560	4,530	2,500	1,830	1,580	3,500	15,000	8,820
16	19,700	5,950	47,000	27,100	6,250	4,530	2,400	1,830	1,580	3,260	14,200	8,490
17	19,300	6,250	37,500	22,600	6,250	4,000	2,200	1,920	1,350	3,030	14,600	8,160
18	20,700	5,650	28,200	19,700	5,950	3,750	2,300	2,100	1,500	3,030	13,100	7,830
19	24,500	5,650	22,600	17,500	5,950	3,500	2,300	1,920	1,500	2,700	12,400	7,190
20	24,000	5,650	23,000	15,800	5,650	3,500	2,100	1,830	1,660	3,750	12,000	6,870
21	21,100	5,950	28,200	13,900	5,360	4,260	1,920	1,920	1,830	6,250	11,600	6,250
22	20,700	6,250	28,200	12,700	5,360	4,260	1,920	1,740	5,650	8,160	11,200	6,560
23	20,200	9,160	25,600	12,000	5,650	4,000	1,830	1,920	5,080	9,500	10,900	6,870
24	18,400	7,830	21,600	11,600	10,900	3,750	1,660	1,920	5,360	7,510	9,840	10,500
25	18,400	7,830	21,100	10,900	13,100	3,500	2,600	1,830	5,080	10,200	9,160	10,200
26	17,500	8,160	23,000	10,200	12,000	3,260	2,400	1,830	4,000	14,600	8,820	14,600
27	15,800	7,510	53,200	10,200	9,840	3,500	2,010	1,740	3,260	15,800	8,160	13,900
28	15,000	13,900	139,000	33,900	9,500	3,750	2,200	1,580	2,600	13,500	8,160	11,200
29	13,500	.....	93,800	38,100	10,500	3,500	2,200	1,740	2,600	10,900	8,160	9,500
30	12,000	.....	56,700	33,300	16,300	3,380	2,200	1,660	2,400	9,160	8,490	8,160
31	11,600	.....	41,800	.....	14,600	.....	2,100	1,830	.....	8,160	.....	7,830

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Delaware River at Riegelsville, N. J., for 1913.

[Drainage area, 6,430 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	72,600	11,600	25,500	3.97	4.58	A.
February	13,900	5,080	7,400	1.15	1.20	A.
March	139,000	6,560	28,900	4.49	5.18	A.
April	38,100	10,200	21,200	3.33	3.72	A.
May	25,600	5,360	10,500	1.68	1.94	A.
June	12,400	3,260	5,680	.922	1.03	A.
July	4,260	1,660	2,380	.409	.47	A.
August	7,190	1,580	2,280	.393	.45	A.
September	5,650	1,350	2,450	.420	.47	A.
October	15,800	2,600	6,130	.992	1.14	A.
November	49,700	4,530	12,800	2.04	2.28	A.
December	14,600	6,250	9,170	1.44	1.66	A.
The year	139,000	1,350	11,200	1.77	24.12	

NOTE.—In order to determine the discharge per square mile and the run-off depth in inches, 250 second-feet were added Apr. 15 to Dec. 15, 1913, before computing the discharge per square mile. Hence the first three columns indicate the actual quantity of water available in the river, and the two remaining columns represent the actual run-off from the drainage area above Riegelsville, including the discharge of the canal.

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WEST BRANCH OF DELAWARE RIVER AT HALE EDDY, N. Y.

Location.—At the highway bridge 400 feet west of Erie Railroad station in the village of Hale Eddy, 8 miles below the power dam of the Deposit Electric Co., and 8½ miles above the junction with East Branch of Delaware River.

Records available.—November 15, 1912, to December 31, 1913. Records were obtained at Hancock about 7 miles below from Oct. 15, 1902 to Dec. 31, 1912.

Drainage area.—611 square miles.

Gage.—Vertical staff in four sections.

Channel and control.—Coarse gravel and bowlders. Control is about three-quarters of a mile below the gage and is practically permanent.

Discharge measurements.—Made from the highway bridge or by wading.

Winter flow.—Seriously affected by ice.

Floods.—The flood of March 25 to 30, 1913, reached a crest elevation of about 15.3 feet on the afternoon of March 27, as determined by observer's readings and high-water marks. The corresponding discharge was approximately 25,000 second-feet, or 41 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of West Branch of Delaware River at Hale Eddy, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 11	Frank Weber	4.90	2,040	Mar. 31	Frank Weber	6.22	3,130
12	do	4.79	1,850	May 8	C. S. DeGolyer	2.28	272
27	do	14.75	22,800	July 30	G. H. Canfield	1.32	56.3

Daily gage height, in feet, of West Branch of Delaware River at Hale Eddy, N. Y., for 1913.

[Wm. Seeley, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	4.5	5.6	6.4	2.75	3.8	1.7	1.30	1.20	1.45	2.15	3.1
2	4.1	3.6	4.8	5.2	2.45	3.6	1.7	1.30	1.25	1.5	2.2	3.2
3	5.5	3.3	4.0	5.1	2.5	3.4	1.5	1.30	1.20	1.5	2.05	3.1
4	7.3	3.2	4.1	4.7	2.35	4.0	1.5	1.40	1.25	1.5	2.0	3.0
5	5.8	3.0	4.2	5.2	2.25	3.3	1.45	1.40	1.20	1.5	2.0	3.1
6	5.4	2.65	4.2	4.8	2.3	3.1	1.45	1.35	1.20	1.5	1.95	2.95
7	6.6	2.6	3.1	4.7	2.15	2.9	1.5	1.30	1.25	1.48	2.0	3.2
8	10.6	2.65	2.8	4.4	2.1	2.75	1.5	1.30	1.15	1.48	1.95	4.3
9	8.6	2.95	3.4	4.2	2.2	2.6	1.48	1.30	1.15	1.40	4.6	4.2
10	6.6	2.75	4.2	4.0	2.3	2.6	1.48	1.40	1.15	1.42	7.6	3.5
11	6.4	3.4	4.8	4.4	2.05	2.45	1.48	1.35	1.25	1.38	5.6	3.6
12	7.5	2.7	4.4	5.2	2.45	2.3	1.42	1.30	1.15	1.30	4.8	3.4
13	6.2	.....	4.7	4.7	2.1	2.3	1.40	1.20	1.15	1.40	4.6	3.4
14	5.4	.....	5.6	4.6	2.05	2.15	1.5	1.20	1.15	1.40	4.6	3.5
15	5.2	.....	6.7	4.5	2.0	2.0	1.5	1.18	1.15	1.45	4.4	3.5
16	4.8	.....	6.6	4.2	2.05	2.15	1.5	1.15	1.10	1.45	4.0	3.4
17	5.8	.....	5.5	3.9	2.05	1.9	1.45	1.20	1.10	1.40	3.9	3.2
18	6.6	.....	4.8	3.8	1.95	2.4	1.5	1.15	1.10	1.35	3.9	3.2
19	6.7	.....	4.6	3.6	2.0	1.85	1.5	1.22	1.15	1.40	3.8	3.1
20	5.6	.....	4.9	3.4	1.95	1.9	1.40	1.30	1.20	2.5	4.0	2.6
21	6.4	.....	5.2	3.4	1.95	2.05	1.40	1.20	1.10	4.0	4.2	2.85
22	5.6	.....	5.4	3.2	1.95	2.0	1.35	1.20	2.1	3.8	3.9	2.75
23	5.2	.....	4.7	4.1	2.15	1.9	1.30	1.25	2.05	2.7	3.8	2.75
24	5.6	.....	5.2	3.5	3.2	1.9	1.35	1.20	2.0	2.5	3.7	3.4
25	5.2	.....	5.7	2.75	3.3	1.8	1.25	1.20	1.9	2.65	3.6	3.2
26	4.7	.....	7.9	2.75	2.95	1.75	1.30	1.15	1.65	2.6	3.6	3.2
27	4.6	.....	13.6	2.5	2.85	1.75	1.30	1.15	1.6	2.8	3.5	2.75
28	4.5	.....	11.9	2.15	3.0	1.7	1.30	1.20	1.5	2.7	3.4	2.4
29	3.9	.....	8.6	2.55	5.4	1.6	1.38	1.20	1.40	2.55	3.2	2.5
30	3.8	.....	7.0	3.0	4.6	1.7	1.40	1.20	1.40	2.4	3.6	2.6
31	3.8	.....	6.2	.....	4.2	.....	1.35	1.20	.....	2.3	.....	2.8

NOTE.—Gage height observations suspended Feb. 13–28 on account of ice.

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Daily discharge, in second-feet, of West Branch of Delaware River at Hale Eddy, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,660	1,660	2,610	3,450	498	1,140	96	53	46	66	220	820
2	1,350	1,000	1,980	2,240	348	1,000	96	53	50	70	240	760
3	2,510	820	1,280	2,150	370	880	70	53	46	70	182	700
4	4,550	760	1,350	1,820	302	1,280	70	61	50	70	165	640
5	2,810	640	1,420	2,240	260	820	66	61	46	70	165	700
6	2,420	445	1,420	1,900	280	700	66	57	46	70	152	610
7	3,680	420	700	1,820	220	580	70	53	50	68	165	760
8	10,400	445	525	1,580	200	498	70	53	42	68	152	1,500
9	6,450	610	880	1,420	240	420	68	53	42	61	1,740	1,420
10	3,680	498	1,420	1,280	280	420	68	61	42	63	4,950	940
11	3,450	880	1,900	1,580	182	348	68	57	50	59	2,610	1,000
12	4,810	470	1,580	2,240	348	280	63	53	42	53	1,900	880
13	3,230	.....	1,820	1,820	200	280	61	46	42	61	1,740	880
14	2,420	.....	2,610	1,740	182	220	70	46	42	61	1,740	940
15	2,240	.....	3,900	1,660	165	165	70	45	42	66	1,580	940
16	1,900	.....	3,680	1,420	182	220	70	42	39	66	1,280	880
17	2,810	.....	2,510	1,210	182	138	66	46	39	61	1,210	760
18	3,680	.....	1,900	1,140	152	325	70	42	39	57	1,210	760
19	3,800	.....	1,740	1,000	165	126	70	47	42	61	1,140	700
20	2,610	.....	1,980	880	152	138	61	53	46	370	1,280	420
21	3,450	.....	2,240	880	152	182	61	46	39	1,280	1,420	552
22	2,610	.....	2,420	760	152	165	57	46	200	1,140	1,210	498
23	2,240	.....	1,820	1,350	220	138	53	50	182	470	1,140	498
24	2,610	.....	2,240	940	760	138	57	46	165	370	1,070	880
25	2,240	.....	2,710	498	820	115	50	46	138	445	1,000	760
26	1,820	.....	5,370	498	610	106	53	42	88	420	1,000	760
27	1,740	.....	19,000	370	552	106	53	42	81	525	940	498
28	1,660	.....	13,800	220	640	96	53	46	70	470	880	325
29	1,210	.....	6,450	395	2,420	81	59	46	61	395	760	370
30	1,140	.....	4,160	640	1,740	96	61	46	61	325	1,000	420
31	1,140	.....	3,230	.....	1,420	.....	57	46	.....	280	.....	525

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge Feb. 13-28 estimated 534 second-feet by comparison with records at Port Jervis.

Monthly discharge of West Branch of Delaware River at Hale Eddy, N. Y., for 1913.

[Drainage area, 611 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	10,400	1,140	2,980	4.88	5.63	A.
February	1,660	.....	614	1.00	1.04	B.
March	19,000	525	3,240	5.30	6.11	A.
April	3,450	220	1,370	2.24	2.50	A.
May	2,420	152	464	.759	.88	A.
June	1,280	81	373	.611	.68	A.
July	96	50	65.3	.107	.12	B.
August	61	42	49.6	.081	.09	C.
September	200	39	65.6	.107	.12	B.
October	1,280	53	249	.408	.47	B.
November	4,950	152	1,140	1.87	2.09	A.
December	1,500	325	745	1.22	1.41	A.
The year	19,000	39	951	1.56	21.14	

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BEAVER KILL AT COOKS FALLS, N. Y.

Location.—At the covered highway bridge in Cooks Falls.
Records available.—July 25 to December 31, 1913.
Drainage area.—Not measured.
Gage.—Vertical staff in two sections.
Channel and control.—Coarse gravel, bowlders, and solid ledge; practically permanent.
Discharge measurements.—Made from highway bridge, or by wading.
Winter flow.—Affected by ice.
Estimates of discharge withheld for additional data.
The following discharge measurement was made by G. H. Canfield:
August 9, 1913: Gage height, 1.12 feet; discharge, 78.7 second-feet.

Daily gage height, in feet, of Beaver Kill at Cooks Falls, N. Y., for 1913.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.88	0.98	1.30	2.15	2.75	16	.....	0.80	0.60	1.45	3.15	2.70
2	.....	.90	1.02	2.32	1.95	2.62	17	.....	.90	.62	1.45	3.05	2.75
3	.....	.80	.92	2.15	2.10	2.55	18	.....	.90	.75	1.75	3.05	2.75
4	.....	.78	.82	1.82	2.10	2.48	19	.....	.90	.85	1.85	3.25	2.52
5	.....	.72	.92	1.58	2.00	2.40	20	.....	.88	.85	4.25	3.45	1.95
6	.....	.72	.88	1.50	2.00	2.30	21	.....	.80	.92	6.15	3.15	2.25
7	.....	1.95	.90	1.50	2.15	3.25	22	.....	.80	4.85	3.90	2.98	2.25
8	.....	1.30	.88	1.58	2.10	4.65	23	.....	.98	2.55	2.75	2.95	2.30
9	.....	1.08	.82	1.88	9.05	3.50	24	.....	1.20	1.90	3.65	2.80	2.50
10	.....	1.02	.80	1.68	7.10	3.12	25	1.15	1.05	1.58	5.70	2.65	2.52
11	.....	.98	.72	1.65	5.05	2.95	26	1.05	.90	1.45	4.90	2.48	2.55
12	.....	.92	.70	1.75	4.25	2.80	27	1.02	.85	1.30	4.10	2.35	2.05
13	.....	.92	.65	1.80	3.98	2.70	28	1.00	1.18	1.28	3.60	2.30	1.95
14	.....	.90	.60	1.55	3.70	2.80	29	1.00	1.15	1.18	3.15	2.85	1.75
15	.....	.85	.60	1.45	3.50	2.80	30	.95	1.15	1.02	2.90	2.95	1.65
							31	.88	1.10	.....	2.50	.....	1.50

MONGAUP RIVER NEAR RIO, N. Y.

Location.—At the highway bridge on Partridge ranch, near Rio, 6 miles above Mongaup and about 7 miles above the mouth.
Records available.—August 8, 1909, to June 27, 1913; data also published in annual reports of the New York State engineer and surveyor.
Drainage area.—189 square miles.
Gage.—Chain on the downstream side of the bridge.
Discharge measurements.—Made from the bridge or by wading.
Winter flow.—Not seriously affected by ice.
Floods.—The high water of March 25 to 30, 1913, reached a stage of 7 feet in the evening of March 27, as determined by observer's readings and high-water marks. The corresponding discharge was approximately 6,500 second-feet, or 34.4 second-feet per square mile of drainage area.
Estimates of discharge withheld for additional data.

Discharge measurements of Mongaup River near Rio, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 14	C. S. De Golyer	1.22	146	Aug. 8	G. H. Canfield	0.76	32.5
14	....do	1.21	145				

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Daily gage height, in feet, of Mongaup River near Rio, N. Y., for 1913.

[Mrs. C. S. Rolles, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	2.2	1.9	2.35	2.45	2.0	1.39	16	2.0	1.48	2.7	2.15	1.15	0.92
2	1.95	1.5	1.75	2.3	1.39	1.34	17	2.4	1.42	2.3	1.95	1.14	.92
3	2.5	1.45	1.75	2.2	1.75	1.28	18	2.35	1.5	2.0	1.85	1.11	.89
4	3.0	1.55	1.65	2.1	1.65	1.22	19	2.3	1.5	1.95	1.7	1.14	.88
5	2.4	1.5	1.6	2.3	1.6	1.18	20	2.15	1.32	2.4	1.8	1.09	.90
6	2.2	1.48	1.55	2.15	1.55	1.14	21	2.4	1.39	2.3	1.6	1.01	1.01
7	2.25	1.6	1.42	2.2	1.5	1.15	22	2.2	1.65	2.5	1.6	1.16	.95
8	4.0	1.6	1.5	1.9	1.5	1.48	23	2.0	2.15	2.2	1.5	1.49	.90
9	2.8	1.55	1.45	1.8	1.45	1.24	24	2.15	1.8	2.25	1.5	1.75	.86
10	2.7	1.6	1.42	1.7	1.38	1.16	25	2.0	1.6	2.15	1.7	1.85	.86
11	2.7	1.42	1.7	2.1	1.31	1.12	26	1.9	1.5	3.0	1.55	1.55	.81
12	2.9	1.5	1.8	3.2	1.26	1.05	27	1.9	1.55	5.2	1.48	1.48	.80
13	2.45	1.48	1.6	2.6	1.28	1.00	28	1.8	2.6	4.6	2.6	1.65	.....
14	2.1	1.48	2.8	2.7	1.22	1.04	29	1.55	.....	3.4	2.9	1.65	.....
15	2.05	1.5	3.0	2.4	1.16	.90	30	1.55	.....	3.0	2.4	1.7	.....
							31	1.7	.....	2.8	.....	1.5	.....

NEVERSINK RIVER AT GODEFFROY, N. Y.

Location.—At the suspension bridge half a mile east of the post office at Godeffroy, half a mile below Brasher Kill, and 8 miles above the mouth.

Records available.—August 4 to October 9, 1903; August 21, 1909, to December 31, 1913; data also published in the annual reports of the New York State engineer and surveyor.

Drainage area.—314 square miles.

Gage.—Chain on the left-hand, downstream cable tower; prior to August 1, 1910, staff gages at about the same location.

Channel and control.—Sand and gravel; probably shifting.

Regulation.—Flow seriously affected by the operation of power plants above the station, especially by the operation of the plant at Roses Point, which supplies electric light and power to Port Jervis and Middletown.

Floods.—The flood of March 25 to 30, 1913, reached a stage of about 9.3 feet on March 27, as reported by the observer and later verified from high-water marks. The corresponding discharge was approximately 12,800 second-feet, or 41 second-feet per square mile of drainage area.

Estimates of discharge withheld for additional data.

Discharge measurements of Neversink River at Godeffroy, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 7	Frank Weber	3.37	260	Aug. 7	G. H. Canfield	2.78	64.2
May 15	C. S. De Golyer	3.52	316	7	.....do	2.78	64.3
15	.....do	3.41	272				

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Daily gage height, in feet, of Neversink River at Godeffroy, N. Y., for 1913.

[Frank Zock, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.
1	3.95	4.05	3.9	3.85	4.85	4.75	4.7	4.5	4.4	4.55	3.55	3.45
2	4.0	3.95	3.9	3.95	4.6	4.7	4.65	4.6	4.35	4.2	3.5	3.6
3	4.05	4.35	3.85	3.9	4.25	4.2	4.55	4.3	4.1	4.05	3.45	3.4
4	5.45	4.85	.....	.....	3.45	.....	4.6	4.4	4.15	4.0	3.35	3.4
5	4.95	4.8	.....	.....	.....	.....	4.4	4.6	4.2	3.9	3.45	3.35
6	4.9	4.65	.....	.....	.....	.....	4.3	4.2	3.85	3.7	3.4	3.45
7	4.65	4.8	.....	.....	.....	3.37	4.35	4.4	3.65	3.6	3.4	3.5
8	6.45	7.15	.....	.....	.....	3.5	4.4	4.6	3.75	3.65	3.45	3.4
9	5.45	5.4	.....	.....	3.4	3.4	4.5	4.45	3.6	3.65	3.35	3.4
10	4.85	4.95	.....	.....	3.45	3.35	4.4	4.55	3.5	3.45	3.4	3.45
11	5.0	5.05	.....	.....	3.6	3.55	4.7	5.6	3.5	3.55	3.35	3.3
12	4.55	4.85	.....	.....	3.4	3.5	5.7	5.45	3.55	3.4	3.45	3.4
13	4.6	4.65	.....	.....	3.35	3.4	5.2	5.15	3.5	3.4	3.35	3.4
14	4.45	4.75	.....	.....	3.8	7.3	4.9	4.6	3.45	3.5	3.4	3.35
15	4.45	4.55	.....	.....	5.8	5.6	4.55	4.3	3.55	3.45	3.3	3.4
16	4.35	4.25	3.75	3.65	5.7	5.5	4.4	4.35	3.45	3.4	3.4	3.35
17	4.15	4.05	3.8	3.85	5.3	5.25	4.3	4.45	3.6	3.45	3.35	3.3
18	4.25	4.05	3.7	3.75	4.9	4.65	4.2	4.15	3.4	3.45	3.3	3.35
19	4.05	4.0	3.9	3.65	4.3	4.15	4.1	4.0	3.45	3.4	3.35	3.3
20	4.25	4.2	3.75	3.7	4.5	4.65	3.9	3.7	3.35	3.4	3.3	3.25
21	4.1	4.0	3.8	3.9	5.3	5.15	3.8	3.8	3.4	3.45	3.35	3.25
22	4.2	4.1	3.65	3.8	5.0	4.8	3.75	3.65	3.35	3.4	3.3	3.35
23	4.1	4.25	3.75	3.7	4.7	4.6	3.6	3.5	3.4	3.7	3.25	3.2
24	4.15	4.1	3.75	3.85	4.6	4.45	3.55	3.6	4.7	4.6	3.25	3.1
25	4.1	4.2	3.45	3.75	4.3	4.25	3.6	3.5	4.6	4.55	3.2	3.25
26	4.15	4.05	3.7	3.8	4.6	5.4	3.4	3.6	4.45	4.35	3.15	3.2
27	4.0	3.95	3.85	3.7	5.9	9.3	3.55	3.4	4.5	4.6	2.9	3.3
28	3.9	4.05	4.35	4.75	7.65	6.8	3.9	6.2	4.6	4.9	2.85	3.2
29	3.75	3.85	.....	.....	5.75	5.5	5.3	5.0	4.5	4.3	2.95	3.25
30	3.85	4.0	.....	.....	4.6	4.4	4.8	4.65	4.35	4.0	2.8	3.1
31	3.75	3.95	.....	.....	4.5	4.55	.....	.....	3.9	3.75	.....	.....

Day.	July.		August.		September.		October.		November.		December.	
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.
1	2.9	3.2	2.9	3.25	2.7	3.15	2.95	3.0	3.95	3.85	4.0	4.15
2	2.85	3.15	3.2	3.45	2.85	3.05	3.95	4.5	3.65	3.55	4.0	4.0
3	2.9	3.2	3.2	3.2	2.75	2.95	4.25	3.5	3.45	3.5	4.15	4.0
4	2.85	3.15	2.95	3.25	2.8	3.15	3.35	3.2	3.5	3.45	4.1	4.15
5	2.9	3.2	2.8	3.3	2.9	2.95	3.0	3.15	3.45	3.35	4.0	4.0
6	2.8	3.15	2.85	3.25	2.85	3.15	3.15	3.2	.....	.....	3.95	3.7
7	3.0	3.25	2.9	2.75	2.75	3.05	3.25	3.1	.....	.....	3.6	3.6
8	2.95	3.2	2.8	3.15	2.8	3.1	3.15	3.05	.....	.....	3.9	3.8
9	2.85	3.15	2.85	3.0	2.85	3.15	3.0	3.1	.....	.....	3.95	4.15
10	2.9	3.2	2.8	3.15	2.7	3.05	3.15	3.2	.....	.....	4.0	4.0
11	2.95	3.15	2.75	2.9	2.8	2.9	3.3	3.3	.....	.....	3.75	3.55
12	2.9	3.25	2.8	2.85	2.75	3.1	3.15	3.35	4.65	4.5	3.5	3.5
13	2.85	3.15	2.75	2.75	2.7	3.1	3.3	3.25	4.45	4.3	3.5	3.55
14	2.95	3.2	2.8	2.8	2.85	2.85	3.2	3.4	4.25	4.35	3.5	3.65
15	2.8	3.15	2.75	3.1	2.7	3.05	3.25	3.35	4.0	4.05	3.65	3.6
16	2.95	3.1	2.8	3.15	2.75	2.95	3.4	3.3	4.0	4.1	3.4	3.4
17	3.1	2.95	2.75	3.05	2.8	2.95	3.3	3.15	4.0	4.15	3.5	3.5
18	2.95	3.15	2.8	3.15	2.95	2.75	3.2	3.25	4.15	4.0	3.5	3.45
19	2.95	3.25	2.7	3.15	2.85	2.7	3.15	3.0	4.0	3.95	3.3	3.25
20	2.9	3.15	2.8	3.05	2.95	2.85	3.6	4.0	4.0	4.0	3.2	3.1
21	2.8	3.15	2.7	2.9	2.7	2.95	5.0	4.6	4.05	4.15	3.1	3.0
22	2.8	3.1	2.75	3.15	3.85	4.6	4.6	4.6	3.95	3.9	3.1	3.15
23	2.85	3.15	2.8	3.0	3.6	3.55	5.15	4.5	3.8	3.7	3.3	3.3
24	2.85	3.2	2.75	3.15	3.5	3.45	4.95	5.25	3.65	3.5	3.4	3.35
25	2.9	3.15	2.8	3.0	3.25	3.2	5.15	5.1	3.5	3.4	3.4	3.45
26	2.85	3.15	2.7	3.05	3.15	3.1	5.0	4.95	3.5	3.5	3.6	3.65
27	2.9	3.2	2.8	2.9	3.25	3.05	4.65	4.35	3.7	3.6	3.8	3.8
28	2.85	3.15	2.85	2.85	2.95	3.15	4.25	4.15	3.6	3.5	3.8	3.85
29	2.8	3.2	2.8	3.15	2.9	2.95	4.1	4.05	4.0	3.9	3.9	3.8
30	2.85	3.1	2.75	3.05	2.8	2.75	4.0	4.1	4.15	3.95	3.8	3.9
31	2.9	3.15	2.7	3.15	.....	.....	4.0	4.05	.....	.....	3.8	3.85

NOTE.—Gage heights observed twice daily as follows: Jan. 1 to Feb. 16, 8 a. m. and 4 p. m.; Feb. 17 to Mar. 23, 7 a. m. and 5 p. m.; Mar. 24 to Oct. 1, 7 a. m. and 6 p. m.; Oct. 2 to Dec. 31, 8 a. m. and 5 p. m.

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LEHIGH RIVER AT SOUTH BETHLEHEM, PA.

Location.—On the New Street Bridge connecting Bethlehem and South Bethlehem.

Records available.—September 22, 1902, to February 13, 1905; April 26, 1909, to December 31, 1913. Complete data 1902 to 1909 are published in Water-Supply Paper 261.

Drainage area.—1,235 square miles.

Gage.—Chain and weight, similar to that employed when the station was first established; datum of the present gage 0.09 foot higher than that of the old one used prior to 1909; elevation of the zero of the present gage 210.64 feet above sea level.

Channel and control.—Sand, gravel, and bowlders; practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Not seriously affected by ice.

Canal.—Lehigh canal follows the left bank and passes over Monocacy Creek and under the left span of the bridge. The creek also passes under the bridge and enters the river a short distance below. An ice plant and gristmill take water from the canal and return it to the river above the bridge. The canal is measured at Main Street Bridge, one-third mile above the station, and the discharge, reduced by the amount of tailrace flow of ice plant and gristmill, is added to the river discharge. At high stages the river overflows into the canal and creek.

Accuracy.—Results good.

Cooperation.—Since its reestablishment this station has been maintained by the Water-Supply Commission of Pennsylvania, and many of the measurements have been made by students of Lehigh University, under the direction of the civil-engineering department.

Discharge measurements of Lehigh River at South Bethlehem, Pa., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 24	R. A. Boehringer	2.34	994
Sept. 3	J. D. Reckord	1.66	353

Daily gage height, in feet, of Lehigh River at South Bethlehem, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.51	3.36	3.65	5.18	6.16	2.95	2.03	1.89	1.88	1.95	2.74	2.86
2	4.35	3.17	3.27	4.64	5.45	2.78	2.02	1.83	1.85	3.26	2.60	2.82
3	4.79	3.18	3.08	4.36	5.00	2.75	1.94	1.73	1.62	2.75	2.69	2.67
4	6.84	3.19	3.02	4.20	4.69	2.78	1.85	1.87	1.64	2.52	2.58	2.61
5	6.43	2.97	3.03	4.15	4.34	2.72	2.00	1.82	1.75	2.27	2.49	2.58
6	4.97	2.82	2.89	3.95	4.14	2.61	1.97	1.82	1.73	2.33	2.42	2.58
7	4.68	2.63	2.51	3.76	3.98	2.54	2.02	2.35	1.72	2.08	2.37	2.73
8	5.14	2.68	2.29	3.63	3.75	2.49	1.90	2.03	2.00	2.01	2.38	3.54
9	5.73	2.64	2.77	3.50	3.63	2.56	1.96	1.85	1.86	2.05	3.56	3.47
10	5.11	2.77	2.89	3.40	3.50	2.48	2.78	1.72	1.67	2.02	6.09	3.11
11	3.95	2.70	3.04	3.66	3.44	2.41	2.24	1.90	1.69	2.01	4.74	3.02
12	4.89	2.70	3.07	5.65	3.32	2.37	2.07	1.80	1.68	2.20	4.03	2.92
13	5.00	2.61	3.03	5.19	3.22	2.34	2.23	1.88	1.66	2.33	3.67	2.83
14	4.49	2.52	5.02	5.41	3.14	2.28	2.26	1.61	1.60	2.07	3.50	2.81
15	4.28	2.53	6.58	5.20	3.00	2.22	2.18	1.64	1.69	1.98	3.36	2.85
16	4.16	2.63	6.52	5.04	2.95	2.28	2.08	1.57	1.63	1.82	3.25	2.80
17	4.21	2.76	5.37	4.62	2.90	2.21	1.99	1.99	1.61	1.93	3.57	2.73
18	4.11	2.57	4.69	4.44	2.87	2.17	1.98	1.96	1.65	1.86	3.29	2.68
19	3.98	2.59	4.62	4.22	2.86	2.17	1.96	1.82	1.63	1.76	3.22	2.59
20	3.90	2.57	4.99	3.96	2.74	2.20	1.84	1.75	1.67	2.48	3.17	2.53
21	3.89	2.62	4.88	3.83	2.69	2.55	1.91	1.72	1.84	3.16	3.08	2.47
22	3.85	2.80	4.68	3.67	2.68	2.47	1.88	1.75	3.63	2.94	3.02	2.58
23	3.72	3.31	4.33	3.60	2.66	2.37	1.82	1.76	2.93	2.73	2.90	2.63
24	3.89	2.89	4.21	3.53	3.92	2.23	2.08	1.77	2.41	2.60	2.92	3.59
25	3.82	2.61	4.05	3.43	3.35	2.11	2.23	1.74	2.13	3.75	2.79	3.54
26	3.68	2.53	4.25	3.33	3.12	2.14	2.07	1.74	2.04	4.30	2.69	4.54
27	3.69	2.74	9.87	3.59	3.00	2.18	1.88	1.64	1.87	3.94	2.61	4.18
28	3.65	4.56	9.77	10.85	3.11	2.23	1.96	1.69	1.76	3.59	2.73	3.69
29	3.45	.....	7.40	8.90	3.27	2.09	1.90	1.79	1.75	3.27	2.76	3.43
30	3.37	.....	6.20	7.41	3.13	2.09	1.92	1.82	1.69	3.04	2.82	3.31
31	3.45	.....	5.65	.....	3.07	.....	1.82	1.83	.....	2.86	.....	3.21

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Daily discharge, in second-feet, of Lehigh River at South Bethlehem, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,520	2,360	2,840	6,080	8,540	1,780	728	602	593	655	1,500	1,68
2	4,180	2,060	2,210	4,810	6,760	1,550	719	550	568	2,240	1,320	1,60
3	5,150	2,070	1,920	4,200	5,640	1,510	646	469	385	1,510	1,430	1,41
4	10,300	2,080	1,840	3,870	4,920	1,550	568	584	400	1,240	1,300	1,34
5	9,240	1,770	1,850	3,770	4,150	1,470	700	542	485	965	1,200	1,30
6	5,570	1,560	1,660	3,380	3,750	1,340	673	542	469	1,030	1,130	1,20
7	4,900	1,320	1,180	3,030	3,430	1,260	719	1,050	461	776	1,070	1,48
8	5,980	1,380	940	2,800	3,010	1,200	610	728	700	710	1,080	2,68
9	7,460	1,330	1,490	2,580	2,800	1,280	664	568	576	748	2,730	2,58
10	5,900	1,490	1,660	2,420	2,580	1,190	1,550	461	422	719	8,400	2,06
11	3,360	1,400	1,870	2,850	2,480	1,120	935	610	438	710	5,080	1,80
12	5,380	1,400	1,910	7,260	2,290	1,070	766	525	430	895	3,580	1,76
13	5,640	1,290	1,850	6,100	2,130	1,040	925	593	415	1,030	2,910	1,57
14	4,480	1,190	5,690	6,660	2,010	975	955	378	370	766	2,620	1,54
15	4,030	1,200	9,630	6,130	1,810	915	875	460	438	682	2,400	1,60
16	3,790	1,320	9,470	5,740	1,740	975	776	349	392	542	2,220	1,53
17	3,890	1,480	6,560	4,760	1,720	905	691	378	637	2,740	1,44
18	3,690	1,250	4,920	4,370	1,670	865	682	664	408	576	2,290	1,38
19	3,430	1,270	4,760	3,910	1,660	865	664	542	392	493	2,180	1,27
20	3,280	1,250	5,620	3,390	1,500	895	559	485	422	1,190	2,100	1,20
21	3,260	1,300	5,350	3,150	1,430	1,270	619	461	559	2,080	1,970	1,14
22	3,190	1,530	4,900	2,870	1,420	1,180	593	485	2,850	1,770	1,880	1,26
23	2,960	2,280	4,130	2,750	1,400	1,070	542	493	1,760	1,480	1,720	1,33
24	3,260	1,660	3,890	2,630	3,360	925	776	501	1,120	1,320	1,740	2,73
25	3,140	1,290	3,570	2,470	2,380	805	925	477	825	3,060	1,560	2,65
26	2,890	1,200	3,970	2,310	2,020	835	766	477	738	4,120	1,430	4,39
27	2,900	1,450	19,100	2,730	1,860	875	593	400	584	3,400	1,340	3,80
28	2,840	4,630	18,800	22,200	2,010	925	664	438	493	2,780	1,480	2,90
29	2,500	.....	11,800	16,100	2,260	786	610	517	485	2,260	1,520	2,47
30	2,370	.....	8,640	11,800	2,040	786	628	542	438	1,910	1,600	2,28
31	2,500	.....	7,260	.....	1,950	.....	542	550	.....	1,660	.....	2,12

Monthly discharge of Lehigh River at South Bethlehem, Pa., for 1913.

[Drainage area, 1,235 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	10,300	2,370	4,390	3.55	4.09
February	4,630	1,190	1,640	1.33	1.5
March	a 27,500	940	5,200	4.21	4.8
April	22,700	2,310	5,240	4.24	4.7
May	8,540	1,400	2,800	2.27	2.6
June	1,780	786	1,110	.899	1.0
July	1,550	542	731	.592	.6
August	1,050	349	538	.436	.5
September	2,850	370	633	.513	.5
October	4,120	493	1,420	1.15	1.3
November	8,400	1,070	2,180	1.77	1.9
December	4,590	1,140	1,930	1.56	1.8
The year	a 27,500	349	2,320	1.88	25.5

a Estimated.

SUSQUEHANNA RIVER BASIN.

SUSQUEHANNA RIVER AT CONKLIN, N. Y.

Location.—At the highway bridge just below Conklin, 5 miles below Big Snake Creek, and 8 miles above Chenango River.

Records available.—November 13, 1912, to December 31, 1913.

Drainage area.—2,350 square miles.

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Gage.—Staff in two sections, the lower section inclined, the upper vertical.

Channel and control.—Coarse gravel and bowlders.

Discharge measurements.—Made from the bridge or by wading.

Winter flow.—Somewhat affected by ice.

Floods.—The high water of March 25 to 30 reached a stage of 18.3 feet on the morning of March 28, as recorded by the observer. The corresponding discharge was approximately 52,000 second-feet, or 22.1 second-feet per square mile of drainage area. The flood peak was maintained for several hours, so that the mean discharge for the day of March 28 was 51,400 second-feet and for the 48 hours, from noon, March 27, to noon, March 29, approximately 49,000 second-feet, or 20.8 second-feet per square mile.

Accuracy.—Results good.

Discharge measurements of Susquehanna River at Conklin, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 14	Frank Weber.....	8.93	7,630	May 6	C. S. De Golyer.....	3.50	1,380
15	.....do.....	9.07	13,100	July 29	G. H. Canfield.....	2.00	302
28	.....do.....	18.20	51,400	Sept. 18	R. S. Barnes.....	1.55	147
31	.....do.....	9.10	13,100				

Daily gage height, in feet, of Susquehanna River at Conklin, N. Y., for 1913.

[Daniel Ames, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	6.1	5.8	6.8	9.0	4.3	4.9	2.5	1.88	1.50	1.72	2.85	4.5
2.....	5.6	5.8	6.8	8.1	4.0	4.6	2.45	1.88	1.50	1.82	2.8	4.4
3.....	6.0	4.6	5.8	7.4	3.8	4.3	2.4	1.85	1.62	1.88	2.8	4.3
4.....	8.6	4.7	5.0	6.9	3.7	4.3	2.4	1.85	1.65	1.82	2.65	4.2
5.....	8.3	4.7	5.0	7.9	3.6	4.0	2.4	1.90	1.65	1.69	2.65	4.2
6.....	7.2	4.4	4.9	6.6	3.5	3.8	2.35	1.85	1.65	1.75	2.65	4.1
7.....	8.6	4.4	.....	6.3	3.5	3.7	2.4	1.82	1.56	1.85	2.6	4.1
8.....	13.0	4.4	.....	6.0	3.4	3.6	2.35	1.82	1.66	1.91	2.5	4.6
9.....	13.5	4.4	.....	5.7	3.35	3.6	2.3	1.82	1.65	1.86	3.0	4.0
10.....	9.8	.....	4.6	5.4	3.3	3.5	2.35	1.80	1.65	1.91	7.1	4.7
11.....	8.1	.....	6.0	5.3	3.25	3.5	2.35	1.82	1.61	1.86	7.6	4.5
12.....	9.2	.....	6.4	6.1	3.1	3.25	2.3	1.75	1.62	1.86	6.3	4.4
13.....	9.4	.....	6.1	6.4	2.95	3.15	2.15	1.75	1.60	1.85	5.4	4.3
14.....	7.5	.....	6.6	6.0	2.9	3.15	2.15	1.72	1.64	1.85	5.1	4.3
15.....	6.8	.....	8.8	5.7	2.9	3.0	2.2	1.75	1.42	1.82	5.3	4.3
16.....	6.5	.....	9.3	5.4	2.9	2.85	2.15	1.75	1.32	1.88	5.3	4.3
17.....	6.8	.....	8.3	5.2	2.9	2.65	2.05	1.73	1.55	1.89	5.1	4.2
18.....	8.6	.....	6.8	4.9	2.8	2.6	.....	1.62	1.52	1.88	5.0	4.1
19.....	9.6	.....	6.1	4.7	2.9	2.6	.....	1.70	1.58	1.92	4.8	4.0
20.....	9.0	.....	6.5	4.6	2.8	2.5	.....	1.65	1.55	2.2	4.7	3.9
21.....	8.5	.....	6.7	4.5	2.75	2.6	.....	1.65	1.62	4.2	5.4	3.7
22.....	8.5	.....	7.6	4.3	2.8	2.5	.....	1.75	2.6	4.2	5.3	3.7
23.....	7.0	5.2	7.1	4.2	3.0	2.7	.....	1.68	2.3	3.8	4.9	3.7
24.....	7.3	5.4	6.6	4.2	4.0	2.6	.....	1.72	2.2	3.5	4.7	4.3
25.....	7.5	5.0	7.2	4.0	4.8	2.65	.....	1.58	2.0	3.15	4.6	4.0
26.....	6.9	.....	10.6	4.0	4.4	2.6	.....	1.60	1.96	3.15	4.6	4.0
27.....	6.4	.....	15.7	3.9	4.0	2.5	.....	1.75	1.92	3.2	4.5	4.0
28.....	6.2	6.0	18.2	4.6	4.2	2.55	.....	1.68	1.90	3.15	4.4	3.6
29.....	5.7	.....	17.0	4.6	5.9	2.5	1.88	1.70	1.84	3.15	4.3	3.3
30.....	4.8	.....	12.4	4.4	6.7	2.55	1.82	1.55	1.72	3.05	4.4	3.7
31.....	5.3	.....	9.4	.....	5.7	.....	1.82	1.50	.....	2.95	.....	3.8

NOTE.—Discharge relation Feb. 7-28 affected by ice.

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Daily discharge, in second-feet, of Susquehanna River at Conklin, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,720	5,060	7,330	12,800	2,390	3,330	590	249	134	192	826	2,600
2	4,640	5,060	7,330	10,500	1,970	2,840	560	249	134	226	790	2,540
3	5,500	2,840	5,060	8,800	1,720	2,390	530	238	163	249	790	2,280
4	11,800	3,000	3,500	7,600	1,600	2,390	530	238	171	226	685	2,240
5	11,000	3,000	3,500	10,000	1,500	1,970	530	257	171	182	685	2,240
6	8,280	2,540	3,330	6,860	1,400	1,720	500	238	171	202	685	2,100
7	11,800	.....	3,160	6,170	1,400	1,600	530	226	148	238	652	2,100
8	26,400	.....	3,000	5,500	1,300	1,500	500	226	174	262	590	2,640
9	28,500	.....	2,840	4,840	1,280	1,500	471	226	171	241	948	1,970
10	15,200	.....	2,840	4,230	1,210	1,400	500	218	171	262	8,040	3,000
11	10,500	.....	5,500	4,040	1,170	1,400	500	226	160	241	9,240	2,600
12	13,400	.....	6,400	5,720	1,030	1,170	471	202	163	241	6,170	2,540
13	14,000	.....	5,720	6,400	907	1,080	385	202	157	238	4,230	2,390
14	9,000	.....	6,860	5,500	866	1,080	385	192	168	238	3,680	2,390
15	7,330	.....	12,300	4,840	866	948	413	202	120	226	4,040	2,390
16	6,630	.....	13,700	4,230	866	828	385	202	106	249	4,040	2,390
17	7,330	.....	11,000	3,860	866	685	330	192	146	253	3,680	2,240
18	11,800	.....	7,330	3,330	790	652	314	163	139	249	3,500	2,100
19	11,600	.....	5,720	3,000	866	652	294	185	152	266	3,160	1,970
20	12,800	.....	6,630	2,840	790	590	285	171	146	413	3,000	1,940
21	11,500	.....	7,100	2,600	754	652	275	171	163	2,240	4,230	1,600
22	11,500	.....	9,240	2,390	790	590	271	202	652	2,240	4,040	1,600
23	7,800	.....	8,040	2,240	948	718	266	179	471	1,720	3,330	1,600
24	8,520	.....	6,860	2,240	1,970	652	257	192	413	1,400	3,000	2,390
25	9,000	.....	8,280	1,970	3,160	685	249	152	303	1,080	2,840	1,970
26	7,560	.....	17,700	1,970	2,540	652	245	157	285	1,080	2,840	1,970
27	6,400	.....	38,200	1,840	1,970	590	245	202	266	1,120	2,600	1,970
28	5,940	.....	51,400	2,840	2,240	621	241	179	257	1,080	2,540	1,500
29	4,840	.....	45,000	2,840	5,280	590	249	185	234	1,080	2,390	1,210
30	3,160	.....	24,000	2,540	7,100	621	226	146	192	991	2,540	1,600
31	4,040	.....	14,000	.....	4,840	.....	226	134	.....	907	.....	1,720

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated Mar. 7-9; estimated by comparison with records at Binghamton, July 18-28. Mean discharge for February estimated from comparative studies.

Monthly discharge of Susquehanna River at Conklin, N. Y., for 1913.

[Drainage area, 2,350 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	28,500	3,160	10,100	4.30	4.96	B.
February	.....	.....	2,790	1.20	1.25	D.
March	51,400	2,840	11,400	4.85	5.59	B.
April	12,800	1,840	4,820	2.05	2.29	A.
May	7,100	754	1,820	.774	.89	A.
June	3,330	590	1,200	.511	.57	A.
July	590	226	379	.161	.19	A.
August	249	134	200	.085	.10	B.
September	652	106	210	.089	.10	B.
October	2,240	182	640	.272	.31	A.
November	9,240	590	3,000	1.28	1.43	A.
December	3,000	1,210	2,130	.910	1.05	A.
The year	51,400	106	3,240	1.38	18.73	

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SUSQUEHANNA RIVER AT WILKES-BARRE, PA.

Location.—At the Market Street Bridge in Wilkes-Barre.
Records available.—1888 to December 31, 1913.
Drainage area.—9,960 square miles (revised).
Gage.—Mott type, maintained by the United States Weather Bureau.
Discharge measurements.—Made from the bridge.
Winter flow.—Seriously affected by ice.
Accuracy.—Results fair.
Cooperation.—Results furnished by the Water Supply Commission of Pennsylvania.

Discharge measurements of Susquehanna River at Wilkes-Barre, Pa., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 19	Reckord and Knight...	9.42	28,000	Dec. 9	Boehringer and Brown.	4.58	6,710
Aug. 5	J. D. Reckord.....	2.13	1,020				

Daily gage height, in feet, of Susquehanna River at Wilkes-Barre, Pa., for 1913.

[Obediah Hemstreet and Robert Montanye, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.13	6.53	7.83	13.33	10.13	7.64	3.04	2.24	2.01	2.33	4.01	4.68
2	7.13	6.63	8.63	11.73	8.13	6.54	2.94	2.54	1.99	2.42	3.85	4.70
3	7.23	6.13	8.33	10.73	7.03	5.74	2.74	2.24	2.00	2.39	3.69	4.76
4	12.73	6.13	7.13	9.63	6.23	5.24	2.84	2.24	1.99	2.39	3.49	4.66
5	15.93	5.53	6.43	9.33	5.63	5.04	2.74	2.16	2.03	2.31	3.36	4.50
6	12.53	6.03	5.93	8.63	5.23	4.74	2.64	2.16	1.97	2.33	3.30	4.36
7	11.03	8.43	5.43	8.43	5.03	4.44	2.64	2.14	1.99	2.33	3.17	4.38
8	12.93	7.83	5.03	8.03	4.73	4.24	2.54	2.19	2.02	2.29	3.10	4.31
9	17.93	7.33	4.53	7.53	4.53	4.14	2.54	2.24	1.99	2.27	3.22	4.60
10	18.43	7.23	4.63	7.13	4.33	3.94	2.64	2.22	1.93	2.24	6.95	4.96
11	14.03	6.43	5.03	6.73	4.13	3.84	2.74	2.16	1.93	2.22	10.89	5.23
12	12.03	5.93	7.53	7.23	4.03	3.74	2.64	2.18	1.90	2.33	9.90	4.81
13	13.63	5.43	8.43	7.93	3.93	3.64	2.64	2.14	1.93	2.22	8.37	4.66
14	13.43	5.13	8.53	8.33	3.73	3.54	2.54	2.12	1.93	2.29	7.07	4.36
15	10.93	4.93	11.03	7.93	3.63	3.44	2.54	2.11	1.91	2.25	6.69	4.46
16	9.43	5.23	14.03	7.33	3.53	3.34	2.54	2.12	1.90	2.21	6.95	4.56
17	8.93	5.23	13.73	6.93	3.53	3.24	2.44	2.11	1.90	2.23	7.10	4.66
18	9.53	4.53	11.33	6.43	3.53	3.14	2.44	2.07	1.93	2.31	6.87	4.53
19	12.93	4.33	9.23	6.13	3.33	3.04	2.44	2.05	1.93	2.29	6.55	4.46
20	13.63	3.83	8.03	5.73	3.43	2.94	2.44	2.03	1.90	2.47	6.18	4.26
21	12.23	3.93	8.13	5.43	3.33	3.14	2.44	2.02	1.91	3.80	5.95	4.20
22	11.83	4.13	9.23	5.23	3.33	3.24	2.34	2.04	2.71	4.25	5.85	4.06
23	11.03	4.53	9.63	5.13	3.43	3.04	2.40	2.06	2.93	4.60	6.19	3.98
24	10.23	4.83	9.03	4.93	4.03	2.94	2.54	2.02	2.63	4.71	5.85	4.16
25	9.73	4.93	8.73	4.83	4.93	2.84	2.44	2.01	2.52	4.37	5.45	4.86
26	9.73	5.83	11.13	4.83	5.73	2.74	2.44	2.01	2.71	4.23	5.25	5.51
27	9.03	4.83	26.02	4.73	5.53	3.04	2.44	2.02	2.62	4.15	5.10	5.50
28	8.43	4.93	28.00	7.23	5.63	3.04	2.44	2.00	2.51	6.87	4.95	5.06
29	7.93	.....	26.49	13.93	8.33	3.04	2.44	2.02	2.45	5.33	4.85	4.36
30	7.23	.....	21.23	13.93	10.93	3.14	2.34	2.02	2.36	4.69	4.71	3.96
31	6.63	.....	16.63	.....	9.13	.....	2.34	2.01	.....	4.40	.....	3.84

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Daily discharge, in second-feet, of Susquehanna River at Wilkes-Barre, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11,800	13,600	19,400	46,300	30,200	18,500	2,080	1,000	850	1,080	4,280	6,330
2	16,200	14,000	23,100	38,200	20,700	13,600	1,910	1,320	842	1,180	3,880	6,400
3	16,700	11,800	21,700	32,200	15,800	10,300	1,590	1,000	845	1,140	3,480	6,610
4	43,200	11,800	16,200	27,800	12,300	8,310	1,740	1,000	842	1,140	3,010	6,260
5	61,900	9,440	13,100	26,400	9,830	7,590	1,590	940	860	1,060	2,720	5,710
6	42,200	11,400	11,000	23,100	8,270	6,540	1,450	940	838	1,080	2,590	5,260
7	34,700	22,100	9,050	22,100	7,560	5,510	1,450	925	842	1,080	2,320	5,320
8	44,200	19,400	7,560	20,300	6,500	4,900	1,320	962	855	1,050	2,180	5,160
9	77,400	17,100	5,810	18,000	5,810	4,620	1,320	1,000	842	1,030	2,420	6,050
10	81,600	16,700	6,160	16,200	5,160	4,100	1,450	987	828	1,000	15,400	7,310
11	50,000	13,100	7,560	14,500	4,590	3,850	1,590	940	828	987	34,000	8,270
12	39,700	11,000	18,000	16,700	4,330	3,600	1,450	955	820	1,080	29,000	6,780
13	47,900	9,050	22,100	19,800	4,080	3,360	1,450	925	828	987	21,900	6,260
14	46,800	7,910	22,600	21,700	3,580	3,130	1,320	910	828	1,050	15,900	5,260
15	34,200	7,200	34,700	19,800	3,340	2,900	1,320	902	822	1,010	14,300	5,580
16	26,800	8,270	50,000	17,100	3,100	2,680	1,320	910	820	978	15,400	5,910
17	24,500	8,270	48,400	15,300	3,100	2,460	1,200	902	820	996	16,100	6,260
18	27,300	5,810	36,200	13,100	3,100	2,260	1,200	880	828	1,060	15,100	5,810
19	44,200	5,160	25,900	11,800	2,660	2,080	1,200	870	828	1,050	13,700	5,580
20	47,900	3,820	20,300	10,200	2,880	1,910	1,200	880	820	1,240	12,000	4,950
21	40,700	4,080	20,700	9,050	2,660	2,260	1,200	855	822	3,750	11,100	4,780
22	38,700	4,590	25,900	8,270	2,660	2,480	1,100	865	1,540	4,920	10,700	4,410
23	34,700	5,810	27,800	7,910	2,880	2,080	1,160	875	1,890	6,050	12,100	4,200
24	30,700	6,860	25,000	7,200	4,330	1,910	1,320	855	1,430	6,440	10,700	4,670
25	28,300	7,200	23,600	6,860	7,200	1,740	1,200	850	1,300	5,290	9,120	6,960
26	28,300	10,600	35,200	6,860	10,200	1,590	1,200	850	1,540	4,870	8,350	9,360
27	25,000	6,860	186,000	6,500	9,440	2,080	1,200	855	1,420	4,640	7,800	9,320
28	22,100	7,200	217,000	16,700	9,830	2,080	1,200	845	1,280	15,100	7,280	7,660
29	19,800	.....	194,000	49,400	21,700	2,080	1,200	855	1,210	8,660	6,920	5,260
30	16,700	.....	111,000	49,400	34,200	2,260	1,100	855	1,120	6,360	6,440	4,150
31	14,000	.....	67,100	.....	25,400	.....	1,100	850	.....	5,380	.....	3,850

Monthly discharge of Susquehanna River at Wilkes-Barre, Pa., for 1913.

[Drainage area, 9,960 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	81,600	11,800	36,100	3.62	4.17
February	22,100	3,820	10,000	1.00	1.04
March	225,000	5,810	43,600	4.38	5.05
April	49,400	6,500	20,000	2.01	2.24
May	34,200	2,660	9,270	.931	1.07
June	18,500	1,590	4,420	.444	.50
July	2,080	1,100	1,360	.137	.16
August	1,320	845	921	.092	.11
September	1,890	820	1,010	.101	.11
October	15,100	978	2,990	.300	.35
November	34,000	2,180	10,700	1.07	1.19
December	9,360	3,850	5,990	.601	.69
The year	225,000	820	12,200	1.22	16.65

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SUSQUEHANNA RIVER AT DANVILLE, PA.

Location.—At the Mill Street Bridge in Danville, 52 miles below Wilkes-Barre, and a mile above the West Branch of the Susquehanna.
Records available.—March 25, 1899, to December 31, 1913.
Drainage area.—11,300 square miles.
Gage.—Chain attached to the bridge.
Channel and control.—Practically permanent.
Discharge measurements.—Made from the bridge.
Winter flow.—Considerably affected by ice.
Accuracy.—Results good.
Cooperation.—Complete data furnished by Water Supply Commission of Pennsylvania.

The following discharge measurement was made by J. D. Reckord:
August 4, 1913: Gage height, 2.10 feet; discharge, 1,590 second-feet.

Daily gage height, in feet, of Susquehanna River at Danville, Pa., for 1913.

[Edward F. Bell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.36	5.86	6.26	12.16	10.06	7.02	2.78	2.22	1.80	2.27	3.65	4.00
2	5.88	5.81	7.06	9.91	7.81	5.92	2.74	2.16	1.88	2.25	3.48	3.90
3	7.31	5.71	7.61	8.99	6.69	5.22	2.64	2.12	1.82	2.24	3.35	3.90
4	9.41	5.61	7.46	8.15	5.91	4.72	2.54	2.12	1.80	2.22	3.20	3.92
5	12.96	5.34	5.86	7.81	5.39	4.39	2.48	2.09	1.80	2.23	3.40	3.82
6	11.26	4.36	5.51	7.46	4.95	4.17	2.52	2.04	1.80	2.11	3.00	3.72
7	9.64	4.26	4.94	7.11	4.66	3.97	2.49	2.03	1.80	2.11	2.90	3.75
8	10.68	3.86	4.58	6.61	4.33	3.82	2.43	2.05	1.76	2.11	2.84	3.96
9	14.66	3.76	4.11	6.39	4.16	3.72	2.34	1.99	1.75	2.10	2.80	4.18
10	15.24	3.81	4.14	6.06	3.96	3.52	2.32	1.95	1.74	2.10	3.70	4.02
11	12.16	3.74	4.46	5.86	3.86	3.47	2.56	2.00	1.73	2.08	7.00	4.38
12	10.56	3.66	5.81	6.16	3.73	3.38	2.52	2.01	1.72	2.09	8.35	4.32
13	10.66	3.66	6.68	6.81	3.59	3.30	2.56	1.95	1.72	2.10	7.18	4.10
14	11.48	3.56	7.71	7.09	3.51	3.22	2.57	2.00	1.73	2.12	6.18	3.95
15	9.71	3.56	9.41	7.01	3.45	3.12	2.44	1.95	1.72	2.05	5.65	3.80
16	8.36	3.56	10.86	6.61	3.41	3.03	2.40	1.92	1.72	2.06	5.62	3.78
17	7.84	3.66	11.76	6.21	3.29	3.02	2.32	1.87	1.70	2.06	5.92	3.92
18	8.11	3.74	10.14	5.86	3.26	2.92	2.30	1.92	1.75	2.06	5.85	3.88
19	10.06	3.61	8.46	5.51	3.21	2.82	2.26	1.90	1.73	2.06	5.62	3.80
20	11.06	3.68	7.31	5.26	3.22	2.80	2.26	1.88	1.73	2.30	5.28	3.72
21	10.41	3.65	6.99	4.83	3.11	3.04	2.30	1.82	1.73	2.95	5.05	3.50
22	9.84	3.68	7.79	4.63	3.06	3.02	2.28	1.80	3.20	3.75	4.90	3.58
23	9.58	3.76	8.11	4.52	3.26	2.97	2.42	1.82	2.90	3.78	4.95	3.52
24	8.94	4.46	7.99	4.39	3.76	2.79	2.62	1.82	2.68	4.04	5.05	3.62
25	8.51	4.31	7.59	4.27	3.96	2.72	2.77	1.84	2.51	4.08	4.85	3.82
26	8.44	4.61	8.46	4.19	4.46	2.72	2.44	1.80	2.38	3.95	4.49	4.70
27	7.96	4.44	16.21	4.11	4.96	2.77	2.32	1.80	2.35	3.85	4.32	5.08
28	7.44	5.11	22.73	7.66	5.16	2.87	2.32	1.80	2.36	4.50	4.22	4.68
29	6.91	.....	21.91	11.81	6.19	2.72	2.32	1.80	2.32	5.25	4.12	4.35
30	6.46	.....	19.21	13.11	9.13	2.78	2.30	1.80	2.26	4.38	4.05	3.90
31	6.11	.....	15.01	.....	7.99	.....	2.24	1.80	.....	3.90	.....	3.68

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Daily discharge, in second-feet, of Susquehanna River at Danville, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	14,600	17,200	19,400	65,900	46,400	23,800	3,400	1,880	1,070	1,990	6,600	8,100
2	17,400	17,000	24,100	45,100	28,800	17,600	3,270	1,750	1,210	1,940	5,920	7,660
3	25,000	16,400	27,500	37,400	21,900	13,900	2,960	1,660	1,100	1,920	5,410	7,660
4	40,900	15,900	26,600	31,100	17,500	11,400	2,670	1,660	1,070	1,880	4,840	7,750
5	74,000	14,500	17,200	28,800	14,800	9,870	2,510	1,600	1,070	1,900	5,600	7,300
6	57,200	9,740	15,400	26,600	12,600	8,860	2,620	1,500	1,070	1,640	4,120	6,880
7	42,800	9,280	12,500	24,400	11,100	7,970	2,530	1,480	1,070	1,640	3,780	7,010
8	51,900	7,480	10,800	21,400	9,600	7,300	2,380	1,520	1,010	1,640	3,590	7,920
9	92,500	7,050	8,600	20,100	8,820	6,880	2,160	1,400	995	1,620	3,460	8,910
10	99,200	7,260	8,730	18,300	7,920	6,080	2,110	1,330	980	1,620	6,800	8,190
11	65,900	6,970	10,200	17,200	7,480	5,880	2,730	1,420	965	1,580	23,700	9,830
12	50,800	6,640	17,000	18,900	6,930	5,520	2,620	1,440	950	1,600	32,500	9,550
13	51,700	6,640	21,800	22,600	6,360	5,220	2,730	1,330	950	1,620	24,800	8,550
14	59,300	6,240	28,200	24,200	6,040	4,920	2,760	1,420	965	1,660	19,000	7,880
15	43,400	6,240	40,900	23,800	5,800	4,550	2,400	1,330	950	1,520	16,100	7,220
16	32,600	6,240	53,500	21,400	5,640	4,230	2,300	1,280	950	1,540	16,000	7,140
17	29,000	6,640	62,000	19,100	5,180	4,190	2,110	1,190	920	1,540	17,600	7,750
18	30,800	6,970	47,100	17,200	5,070	3,850	2,060	1,280	995	1,540	17,200	7,570
19	46,400	6,440	33,300	15,400	4,880	3,520	1,970	1,240	965	1,540	16,000	7,220
20	55,400	6,720	25,600	14,100	4,920	3,460	1,970	1,210	965	2,060	14,200	6,880
21	49,500	6,600	23,600	12,000	4,520	4,260	2,060	1,100	965	3,950	13,000	6,000
22	44,500	6,720	28,700	11,000	4,340	4,190	2,010	1,070	4,840	7,010	12,300	6,320
23	42,300	7,060	30,800	10,500	5,070	4,020	2,350	1,100	3,780	7,140	12,600	6,080
24	37,000	10,200	30,000	9,870	7,050	3,430	2,900	1,100	3,080	8,280	13,000	6,480
25	33,700	9,510	27,400	9,320	7,920	3,200	3,360	1,140	2,590	8,460	12,100	7,300
26	33,200	10,900	33,300	8,960	10,200	3,200	2,400	1,070	2,250	7,880	10,300	11,300
27	29,800	10,100	111,000	8,600	12,600	3,360	2,110	1,070	2,180	7,440	9,550	13,200
28	20,400	13,400	226,000	27,900	13,600	3,680	2,110	1,070	2,200	10,400	9,090	11,200
29	23,200	.....	208,000	62,500	19,000	3,200	2,110	1,070	2,110	14,100	8,640	9,690
30	20,500	.....	154,000	75,600	38,600	3,400	2,060	1,070	1,970	9,830	8,320	7,660
31	18,600	.....	96,500	.....	30,000	.....	1,920	1,070	.....	7,660	.....	6,720

Monthly discharge of Susquehanna River at Danville, Pa., for 1913.

[Drainage area, 11,300 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	99,200	14,600	43,200	3.82	4.40
February	17,200	6,240	9,360	.828	.86
March	235,000	8,600	47,700	4.22	4.87
April	80,900	8,600	25,000	2.21	2.47
May	53,100	4,340	12,600	1.12	1.29
June	23,800	3,200	6,500	.575	.64
July	3,400	1,920	2,440	.216	.25
August	1,880	1,070	1,320	.117	.13
September	4,840	920	1,540	.136	.15
October	14,100	1,520	4,070	.360	.42
November	32,500	3,460	11,900	1.05	1.17
December	13,200	6,000	8,030	.711	.82
The year	235,000	920	14,500	1.28	17.47

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SUSQUEHANNA RIVER AT HARRISBURG, PA.

Location.—At the Walnut Street Bridge at Harrisburg, 1½ miles above Paxton Creek and 2 miles below Conodoginnet Creek.

Records available.—1890 to December 31, 1913.

Drainage area.—24,100 square miles (revised).

Gage.—Vertical staff in pump well at city waterworks; chain gage on Walnut Street Bridge.[1]

Channel and control.—Practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Affected by ice.

Accuracy.—Results good.

Cooperation.—Results furnished by the Water Supply Commission of Pennsylvania.

The following discharge measurement was made by Langenheim and Reckord:

March 28, 1913: Gage height, 19.46 feet; discharge, 417,000 second-feet.

Daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.55	4.16	3.72	8.87	8.97	6.67	1.71	1.40	0.40	1.18	3.40	2.80
2	3.94	4.09	4.07	7.47	6.97	5.49	1.69	1.31	.39	1.78	3.05	2.74
3	4.36	4.00	4.38	6.55	5.82	4.72	1.52	1.24	.39	1.67	2.72	2.69
4	6.75	3.79	4.47	5.96	5.15	4.20	1.41	1.12	.39	1.54	2.50	2.63
5	8.05	3.44	4.09	5.39	4.45	3.74	1.31	.99	.39	1.53	2.29	2.57
6	8.74	3.08	3.61	5.18	4.03	3.33	1.32	.96	.43	1.59	2.19	2.50
7	7.19	2.62	3.16	4.76	3.70	3.08	1.16	1.17	.40	1.48	2.05	2.53
8	6.86	2.36	2.92	4.52	3.42	2.90	1.30	1.15	.38	1.41	1.99	3.05
9	11.31	2.05	2.79	4.30	3.21	2.65	1.78	.96	.38	1.25	1.94	3.81
10	12.82	2.43	2.62	4.08	2.97	2.50	1.67	.95	.37	1.12	2.76	3.83
11	10.56	2.38	2.69	3.90	2.77	2.39	1.93	.90	.48	1.04	5.05	3.79
12	8.85	2.48	3.05	3.96	2.58	2.21	2.41	.76	.41	.99	7.18	3.65
13	8.60	2.32	3.70	4.24	2.48	2.12	2.86	.76	.36	.99	6.29	3.47
14	9.08	2.37	4.49	4.54	2.40	2.00	2.39	.77	.29	.97	5.43	3.28
15	8.18	2.30	6.16	4.80	2.33	1.92	2.29	.79	.27	.98	4.51	3.03
16	6.94	2.39	7.10	4.73	2.27	1.81	2.66	.80	.28	.99	4.71	2.87
17	6.17	2.48	8.12	4.52	2.20	1.77	2.36	.75	.23	1.00	4.60	2.79
18	5.95	2.43	7.43	4.29	2.19	1.64	2.00	.69	.31	.97	4.80	2.67
19	6.15	2.45	6.28	4.00	2.11	1.59	1.78	.59	.40	.99	4.77	2.64
20	7.69	2.56	5.43	3.74	2.01	1.58	1.60	.58	.36	1.18	4.46	2.53
21	7.70	2.39	4.94	3.50	1.99	1.57	1.47	.55	.45	1.86	4.17	2.46
22	7.18	2.37	4.60	3.29	1.97	1.61	1.35	.55	1.32	2.89	3.94	2.35
23	6.82	2.60	5.00	3.15	1.97	1.74	1.23	.60	1.87	3.53	3.68	2.28
24	6.54	2.69	5.03	3.03	2.20	1.71	1.25	.59	1.98	3.39	3.46	2.40
25	6.50	2.63	4.83	2.92	2.54	1.70	1.82	.52	1.66	3.43	3.37	2.79
26	6.56	2.58	5.35	2.82	3.20	1.66	2.06	.49	1.34	3.67	3.21	3.59
27	6.27	2.58	11.27	2.75	3.55	1.56	2.40	.47	1.14	5.06	3.00	4.07
28	5.77	2.93	19.21	3.64	4.72	1.62	2.09	.40	.99	5.83	2.87	4.03
29	5.33	.....	17.91	8.97	8.21	1.64	1.83	.54	.92	5.16	2.83	3.59
30	4.88	.....	14.70	10.44	8.70	1.64	1.60	.50	.93	4.64	2.81	3.00
31	4.50	.....	11.32	.....	7.93	.....	1.50	.46	.....	3.95	.....	2.81

[1] For full information regarding the two gages and changes in condition of flow, see U. S. Geol. Survey Water Supply Papers 109 and 167.

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Daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	30,200	38,900	32,600	123,000	125,000	80,500	11,300	8,900	3,590	7,510	28,200	21,000
2	35,800	37,900	37,600	95,500	86,000	59,800	11,100	8,300	3,550	11,800	23,600	20,400
3	41,900	36,600	42,200	78,300	65,500	47,500	9,760	7,870	3,550	10,900	20,200	19,900
4	81,900	33,600	43,600	67,900	54,200	39,500	8,970	7,150	3,550	9,920	18,100	19,300
5	107,000	28,700	37,900	58,200	43,300	32,900	8,300	6,420	3,550	9,840	16,200	18,800
6	120,000	23,900	31,000	54,700	37,000	27,200	8,360	6,260	3,710	10,300	15,300	18,100
7	90,200	19,200	24,900	48,100	32,300	23,900	7,390	7,450	3,590	9,470	14,100	18,400
8	84,000	16,800	22,200	44,400	28,400	22,000	8,230	7,330	3,520	8,970	13,600	23,600
9	175,000	14,100	20,900	41,000	25,600	19,500	11,800	6,260	3,520	7,930	13,200	33,900
10	212,000	17,500	19,200	37,800	22,700	18,100	10,900	6,200	3,480	7,150	20,600	34,200
11	158,000	17,000	19,900	35,200	20,700	17,100	13,100	5,930	3,910	6,700	52,600	33,600
12	123,000	17,900	23,600	36,000	18,800	15,500	17,300	5,210	3,630	6,420	90,000	31,600
13	118,000	16,500	32,300	40,100	17,900	14,700	21,600	5,210	3,440	6,420	73,700	29,100
14	127,000	16,900	43,900	44,700	17,200	13,700	17,100	5,260	3,190	6,310	58,800	26,500
15	109,000	16,300	71,400	48,800	16,600	13,000	16,200	5,360	3,120	6,370	44,200	23,300
16	85,500	17,100	88,500	47,700	16,000	12,100	19,600	5,410	3,150	6,420	47,400	21,700
17	71,600	17,900	108,000	44,400	15,400	11,800	16,800	5,160	2,990	6,480	45,600	20,900
18	67,700	17,500	94,800	40,800	15,300	10,700	13,700	4,860	3,260	6,310	38,800	19,700
19	71,200	17,600	73,500	36,600	14,600	10,300	11,800	4,390	3,590	6,420	48,300	19,400
20	99,800	18,700	58,800	32,900	13,800	10,200	10,400	4,350	3,440	7,510	43,800	18,400
21	100,000	17,100	50,900	29,500	13,600	10,100	9,400	4,220	3,790	12,500	39,100	17,700
22	90,000	16,900	45,600	26,700	13,400	10,500	8,560	4,220	8,360	21,900	35,800	16,700
23	83,200	19,000	51,800	24,800	13,400	11,500	7,810	4,440	12,600	29,900	32,000	16,100
24	78,100	19,900	52,300	23,300	15,400	11,300	7,930	4,390	13,500	28,000	29,000	17,200
25	77,400	19,300	49,200	22,200	18,500	11,200	12,200	4,080	10,900	28,600	27,700	20,900
26	78,500	18,800	57,500	21,200	25,400	10,900	14,200	3,950	8,500	31,900	25,600	30,800
27	73,300	18,800	174,000	20,500	30,200	10,100	17,200	3,870	7,270	52,800	23,000	37,600
28	64,600	22,300	396,000	31,500	47,500	10,500	14,500	3,590	6,420	65,600	21,700	37,000
29	57,200	.....	354,000	125,000	110,000	10,700	12,200	4,170	6,040	54,400	21,300	30,800
30	50,000	.....	261,000	155,000	120,000	10,700	10,400	4,000	6,090	46,300	21,100	23,000
31	44,100	.....	175,000	.....	104,000	.....	9,610	3,830	.....	35,900	.....	21,100

Monthly discharge of Susquehanna River at Harrisburg, Pa., for 1913.

[Drainage area, 24,100 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area.
	Maximum.	Minimum.	Mean.	Per square mile.	
January	212,000	30,200	90,500	3.75	4.32
February	38,900	14,100	21,200	.880	.92
March	407,000	19,200	83,700	3.47	4.00
April	155,000	20,500	51,200	2.12	2.37
May	125,000	13,400	38,600	1.60	1.84
June	80,500	10,100	20,200	.838	.94
July	21,600	7,390	12,200	.506	.58
August	8,900	3,590	5,420	.225	.26
September	13,500	2,990	5,090	.211	.24
October	65,600	6,310	18,300	.759	.88
November	90,000	13,200	33,700	1.40	1.56
December	37,600	16,100	23,900	.992	1.14
The year	407,000	2,990	33,800	1.40	19.05

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CHENANGO RIVER NEAR CHENANGO FORKS, N. Y.

Location.—About 1½ miles below Tioughnioga River, 2 miles by road below Chenango Forks post office and 11½ miles above Binghamton and the mouth.

Records available.—November 11, 1912, to December 31, 1913.

Drainage area.—1,420 square miles.

Gage.—Inclined staff on left bank.

Channel and control.—Sand, gravel, and small cobblestones; practically permanent.

Discharge measurements.—Made from a cable near gage, or by wading.

Winter flow.—Somewhat affected by ice.

Diversions.—Water is diverted from 30 square miles at the head of Chenango River and from 18.2 square miles on Tioughnioga River and Erie Canal. These two areas have been subtracted from the total area of 1,468 square miles.

Floods.—The high water of March 25 to 30, 1913, reached a maximum stage of about 13.7 feet on the afternoon of March 27, as recorded by the observer and later verified from high-water marks. The corresponding discharge was 35,500 second-feet, or 25 second-feet per square mile of drainage area.

Accuracy.—Results good.

Discharge measurements of Chenango River near Chenango Forks, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 17	Frank Weber	6.00	5,880	Sept. 17	R. S. Barnes	2.29	139
May 5	C. S. DeGolyer	3.18	722	Oct. 29	do	3.12	670
Aug. 6	G. H. Canfield	2.35	141				

Daily gage height, in feet, of Chenango River near Chenango Forks, N. Y., for 1913.

[Erastus Ingraham, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.9	4.8	.....	6.4	3.45	4.8	2.68	2.42	2.30	2.40	3.1	4.0
2	4.4	4.35	.....	5.8	3.4	3.7	2.60	2.38	2.30	2.42	2.95	3.8
3	5.2	4.3	.....	5.3	3.2	3.55	2.68	2.35	2.30	2.42	2.94	3.6
4	8.4	4.2	.....	5.2	3.2	3.45	2.65	2.40	2.35	2.38	2.85	3.5
5	6.8	4.25	.....	5.2	3.2	3.4	2.65	2.40	2.35	2.40	2.92	3.5
6	6.8	3.9	.....	5.1	3.15	3.25	2.65	2.35	2.35	2.45	2.95	3.4
7	8.6	3.45	.....	4.8	3.1	3.25	2.65	2.32	2.30	2.42	2.88	3.4
8	10.1	3.45	.....	4.7	3.1	3.3	2.65	2.30	2.30	2.45	2.80	3.7
9	9.0	3.25	.....	4.6	3.05	3.2	2.65	2.32	2.30	2.48	2.92	4.2
10	6.9	3.25	5.6	4.4	3.0	3.3	2.65	2.35	2.22	2.32	4.05	3.7
11	6.3	3.1	7.3	4.6	3.0	3.3	2.60	2.30	2.20	2.38	5.1	3.65
12	8.3	.....	7.1	5.4	3.0	3.0	2.60	2.30	2.20	2.35	4.9	3.7
13	7.4	.....	5.7	5.1	3.0	2.90	2.68	2.35	2.20	2.48	5.6	3.4
14	6.2	.....	7.2	4.8	2.91	2.80	2.60	2.40	2.28	2.48	5.0	3.6
15	5.8	.....	7.9	4.6	2.75	2.86	2.62	2.28	2.20	2.40	4.2	3.9
16	5.6	.....	7.8	4.45	2.76	2.85	2.55	2.30	2.20	2.45	3.95	3.6
17	6.5	.....	6.2	4.3	2.90	2.81	2.50	2.30	2.22	2.34	4.1	3.6
18	8.0	.....	5.4	4.1	2.92	2.80	2.50	2.28	2.32	2.42	3.95	3.6
19	8.2	.....	5.3	4.0	2.94	2.80	2.48	2.25	2.40	2.48	3.8	3.45
20	7.0	.....	6.3	3.95	2.91	2.80	2.46	2.22	2.48	2.58	3.75	3.3
21	7.0	.....	6.0	3.8	2.92	2.82	2.52	2.20	2.58	3.5	3.9	3.2
22	6.3	.....	6.4	3.65	2.98	2.82	2.52	2.25	2.72	3.8	4.3	3.4
23	5.6	.....	5.4	3.6	3.35	2.80	2.51	2.35	2.68	3.8	4.05	3.55
24	6.0	.....	5.2	3.6	4.4	2.80	2.50	2.32	2.58	3.7	4.3	3.85
25	5.7	.....	6.9	3.6	3.9	2.75	2.52	2.35	2.50	3.5	4.2	3.9
26	5.2	.....	10.8	3.55	3.5	2.75	2.50	2.32	2.55	3.4	3.9	3.8
27	5.2	.....	13.4	3.4	3.55	2.80	2.42	2.35	2.50	3.3	3.8	3.5
28	4.8	.....	11.8	3.4	3.75	2.70	2.45	2.35	2.50	3.3	3.6	3.3
29	4.6	.....	9.0	3.4	4.8	2.80	2.45	2.35	2.50	3.2	3.7	3.4
30	4.2	.....	7.4	3.5	4.7	2.80	2.45	2.35	2.50	3.1	3.9	3.6
31	4.6	.....	6.6	.....	4.15	.....	2.48	2.35	.....	3.05	.....	3.7

NOTE.—Gage height observations Feb. 12 to Mar. 9 suspended on account of ice.

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Daily discharge, in second-feet, of Chenango River near Chenango Forks, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,350	3,160	.....	6,830	1,020	3,160	335	188	132	178	660	1,780
2	2,440	2,360	.....	5,310	960	1,330	286	168	132	188	531	1,470
3	3,960	2,270	.....	4,170	750	1,140	335	155	132	188	523	1,200
4	12,700	2,100	.....	3,960	750	1,020	316	178	155	168	453	1,080
5	7,930	2,180	.....	3,960	750	960	316	178	155	178	507	1,080
6	7,930	1,620	.....	3,750	705	800	316	155	155	203	531	960
7	13,400	1,020	.....	3,160	660	800	316	141	132	188	476	960
8	19,400	1,020	.....	2,970	660	850	316	132	132	203	416	1,330
9	15,000	800	.....	2,790	616	750	316	141	132	219	507	2,100
10	8,210	800	4,840	2,440	572	850	316	155	100	141	1,860	1,330
11	6,570	660	9,400	2,790	572	850	268	132	92	168	3,750	1,200
12	12,400	.....	8,800	4,390	572	572	286	132	92	155	3,350	1,330
13	9,700	.....	5,070	3,750	572	491	335	155	92	219	4,840	960
14	6,310	.....	9,100	3,160	499	416	286	178	124	219	3,550	1,200
15	5,310	.....	11,200	2,790	381	461	298	124	92	178	2,100	1,620
16	4,840	.....	10,900	2,520	388	453	257	132	92	203	1,700	1,200
17	7,100	.....	6,310	2,270	491	423	230	132	100	150	1,940	1,200
18	11,500	.....	4,390	1,940	507	416	230	124	141	188	1,700	1,200
19	12,100	.....	4,170	1,780	523	416	219	112	178	219	1,470	1,020
20	8,500	.....	6,570	1,700	499	416	208	100	219	274	1,400	850
21	8,500	.....	5,800	1,470	507	431	241	92	274	1,080	1,620	750
22	6,570	.....	6,830	1,260	555	431	241	112	361	1,470	2,270	960
23	4,840	.....	4,390	1,200	905	416	235	155	335	1,470	1,860	1,140
24	5,800	.....	3,960	1,200	2,440	416	230	141	274	1,330	2,270	1,540
25	5,070	.....	8,210	1,200	1,620	381	241	155	230	1,080	2,100	1,620
26	3,960	.....	22,200	1,140	1,080	381	230	141	257	960	1,620	1,470
27	3,960	.....	34,000	960	1,140	416	188	155	230	850	1,470	1,080
28	3,160	.....	26,200	960	1,400	348	203	155	230	850	1,200	850
29	2,790	.....	15,000	960	3,160	416	203	155	230	750	1,330	960
30	2,100	.....	9,700	1,080	2,970	416	203	155	230	660	1,620	1,200
31	2,790	.....	7,370	.....	2,020	.....	219	155	.....	616	.....	1,330

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge for February and March estimated from climatologic data and hydrograph comparisons.

Monthly discharge of Chenango River near Chenango Forks, N. Y., for 1913.

[Drainage area, 1,420 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	19,400	2,100	7,360	5.18	5.97	A.
February	3,160	.....	1,260	.887	.92	C.
March	34,000	.....	7,870	5.54	6.39	C.
April	6,830	960	2,600	1.83	2.04	A.
May	3,160	381	976	.687	.79	A.
June	3,160	348	688	.485	.54	A.
July	335	188	266	.187	.22	B.
August	188	92	145	.102	.12	B.
September	361	92	174	.123	.14	B.
October	1,470	141	482	.339	.39	B.
November	4,840	416	1,650	1.16	1.29	A.
December	2,100	750	1,230	.866	1.00	A.
The year	34,000	92	2,070	1.46	19.81	

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CHEMUNG RIVER AT CHEMUNG, N. Y.

Location.—At the new highway bridge about midway between Chemung, N. Y., and Willawana, Pa., half a mile upstream from the State line and about 10 miles above the mouth.

Records available.—September 11, 1903, to December 31, 1913; data also published in the annual reports of the New York State engineer and surveyor.

Drainage area.—2,440 square miles.

Gage.—Tape gage on the new highway bridge.

Channel and control.—Sand and gravel; practically permanent.

Discharge measurements.—Made from the bridge.

Winter flow.—Affected by needle ice.

Floods.—The high water of March 25 to 30, 1913, reached a crest elevation of about 16.5 feet near midnight of March 26, as recorded by the observer and later determined from high-water marks. The corresponding discharge was approximately 52,500 second-feet, or 21.5 second-feet per square mile of drainage area.

Accuracy.—Results fair.

Discharge measurements of Chemung River at Chemung, N. Y., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 18	Frank Weber	4.31	2,550	May 3	C. S. De Golyer	5.34	4,420
May 2	C. S. De Golyer	5.78	5,620	Aug. 1	G. H. Canfield	1.90	180

Daily gage height, in feet, of Chemung River at Chemung, N. Y., for 1913.

[D. L. Orcutt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.9	4.2	4.6	6.4	7.0	4.3	2.55	1.91	1.70	1.76	3.5	3.2
2	3.8	3.8	4.8	5.6	6.0	3.9	2.41	1.88	1.73	1.85	3.3	3.1
3	4.6	3.2	3.8	5.2	5.3	3.7	2.30	1.82	1.78	2.35	3.15	3.1
4	11.1	3.5	3.4	5.6	4.8	3.5	2.26	1.85	1.75	2.25	3.05	3.05
5	6.9	3.4	3.3	5.4	4.4	3.3	2.44	1.83	1.72	2.14	2.9	2.9
6	5.9	3.2	3.2	5.3	4.2	3.15	2.42	1.86	1.72	2.08	2.85	2.9
7	7.3	3.3	3.0	5.0	4.0	3.05	2.36	1.82	1.70	2.00	2.75	2.85
8	9.0	.....	2.95	4.8	3.8	3.0	2.28	1.82	1.66	1.96	2.75	2.95
9	10.2	.....	3.0	4.6	3.6	3.05	2.23	2.05	1.69	1.94	3.4	3.2
10	6.6	.....	4.6	4.4	3.5	2.95	2.27	1.94	1.66	1.91	10.6	2.95
11	6.1	.....	4.8	4.4	3.4	2.85	2.28	1.89	1.66	1.86	6.7	2.5
12	7.1	.....	5.2	4.9	3.25	2.75	2.34	1.81	1.66	1.90	5.3	2.75
13	7.4	.....	4.2	4.6	3.2	2.7	2.26	1.86	1.64	1.88	4.8	2.8
14	5.7	.....	4.8	4.4	3.1	2.65	2.22	1.79	1.64	2.07	4.8	2.95
15	5.3	.....	6.9	4.3	3.05	2.55	2.19	1.78	1.60	2.07	5.2	2.9
16	5.0	.....	6.7	4.2	3.05	2.55	2.19	1.80	1.59	2.06	4.7	2.9
17	5.9	.....	5.2	4.0	2.95	2.45	2.16	1.80	1.60	1.92	4.7	2.85
18	8.1	.....	4.4	3.8	2.9	2.42	2.12	1.84	1.62	1.91	4.5	2.8
19	8.3	.....	4.1	3.6	2.9	2.38	2.10	1.76	1.69	1.89	4.2	2.75
20	6.6	.....	4.1	3.6	2.8	2.46	2.06	1.73	1.66	2.29	4.1	2.6
21	6.9	.....	4.4	3.45	2.75	2.46	2.06	1.71	1.70	3.7	4.0	2.7
22	6.4	.....	4.7	3.35	2.75	2.55	2.04	1.70	2.02	3.9	3.9	2.7
23	5.5	.....	4.4	3.3	2.9	2.65	2.02	1.75	2.40	3.25	3.7	2.65
24	5.9	.....	4.2	3.45	3.7	2.55	2.08	1.74	2.37	2.95	3.6	3.1
25	5.9	.....	6.9	3.6	4.2	2.46	2.15	1.68	2.14	2.85	3.45	3.8
26	5.2	.....	14.2	3.4	3.8	2.9	2.10	1.76	2.04	5.0	3.4	3.7
27	5.0	.....	16.2	3.3	3.8	3.2	2.06	1.74	1.96	7.4	3.25	3.1
28	4.8	.....	14.9	10.0	5.9	3.1	2.06	1.70	1.84	5.2	3.2	3.1
29	4.3	.....	9.2	13.9	8.0	2.85	2.02	1.74	1.86	4.4	3.15	3.15
30	4.1	.....	7.5	9.0	5.7	2.65	2.00	1.76	1.74	4.0	3.15	3.2
31	4.1	.....	6.6	.....	4.8	.....	1.95	1.76	.....	3.7	.....	3.25

NOTE.—Gage height observations suspended Feb. 8–28 on account of ice.

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Daily discharge, in second-feet, of Chemung River at Chemung, N. Y., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,880	2,310	2,980	7,050	8,700	2,470	520	184	105	126	1,380	1,060
2	1,750	1,750	3,360	5,060	6,050	1,880	436	172	116	160	1,160	960
3	2,980	1,060	1,750	4,180	4,400	1,620	370	148	133	400	1,010	960
4	23,800	1,380	1,270	5,060	3,360	1,380	350	160	122	345	910	910
5	8,410	1,270	1,160	4,620	2,630	1,160	454	152	112	290	770	770
6	5,800	1,060	1,060	4,400	2,310	1,010	442	164	112	260	730	770
7	9,600	.....	860	3,760	2,020	910	406	148	105	220	655	730
8	15,200	.....	815	3,360	1,750	860	360	148	93	204	655	815
9	20,000	.....	860	2,980	1,500	910	335	245	102	196	1,270	1,060
10	7,570	.....	2,980	2,630	1,380	815	355	196	93	184	21,600	815
11	6,300	.....	3,360	2,630	1,270	730	310	176	93	164	7,840	690
12	9,000	.....	4,180	3,560	1,110	655	394	144	93	180	4,400	655
13	9,900	.....	2,310	2,980	1,060	620	350	164	87	172	3,360	690
14	5,300	.....	3,360	2,630	960	585	330	136	87	255	3,360	815
15	4,400	.....	8,410	2,470	910	520	315	133	75	255	4,180	770
16	3,760	.....	7,840	2,310	910	520	315	140	73	250	3,170	770
17	5,800	.....	4,180	2,020	815	460	300	140	75	188	3,170	730
18	12,100	.....	2,630	1,750	770	442	280	156	81	184	2,800	690
19	12,800	.....	2,160	1,500	770	418	270	126	102	176	2,310	655
20	7,570	.....	2,160	1,500	690	466	250	116	93	365	2,160	550
21	8,410	.....	2,630	1,320	655	466	250	108	105	1,620	2,020	630
22	7,050	.....	3,170	1,220	655	520	240	105	230	1,880	1,880	620
23	4,840	.....	2,630	1,160	770	585	230	122	430	1,110	1,620	585
24	5,800	.....	2,310	1,320	1,620	520	260	119	412	815	1,500	960
25	5,800	.....	8,410	1,560	2,310	466	295	99	290	730	1,320	1,750
26	4,180	.....	39,000	1,270	1,750	770	270	126	240	3,760	1,270	1,620
27	3,760	.....	49,000	1,160	1,750	1,060	250	119	204	9,900	1,110	960
28	3,360	.....	42,500	19,200	5,800	960	250	105	156	4,180	1,060	960
29	2,470	.....	16,000	37,500	11,800	730	230	119	164	2,630	1,010	1,010
30	2,160	.....	10,200	15,200	5,300	585	220	126	119	2,020	1,010	1,060
31	2,160	.....	7,570	.....	3,360	.....	200	126	.....	1,620	.....	1,110

NOTE.—Discharge determined from a well-defined rating curve. Mean discharge for February estimated from hydrograph comparisons.

Monthly discharge of Chemung River at Chemung, N. Y., for 1913.

[Drainage area, 2,440 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	23,800	1,750	7,220	2.96	3.41	B.
February	.....	.....	1,080	.443	.46	D.
March	49,000	815	7,780	3.19	3.68	B.
April	37,500	1,160	4,910	2.01	2.24	A.
May	11,800	655	2,550	1.05	1.21	A.
June	2,470	418	836	.343	.38	B.
July	520	200	317	.130	.15	B.
August	245	99	143	.058	.07	B.
September	430	73	143	.058	.06	B.
October	9,900	126	1,120	.459	.53	B.
November	21,600	655	2,690	1.10	1.23	A.
December	1,750	490	868	.356	.41	B.
The year	49,000	73	2,490	1.02	13.83	

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WEST BRANCH OF SUSQUEHANNA RIVER AT WILLIAMSPORT, PA.

Location.—At the Market Street Bridge in Williamsport, 2 miles below Lycoming Creek and about 2 miles above Loyalsock Creek.
Records available.—March 1, 1895, to December 31, 1913.
Drainage area.—5,670 square miles.[1]
Gage.—Chain, fastened to the bridge.
Channel and control.—Practically permanent.
Discharge measurements.—Made from the bridge or by wading.
Regulation.—There is a dam about one-half mile above the station, but the operation of this dam probably has no effect on the daily gage height.
Winter flow.—Affected by ice.
Accuracy.—Results good.
Cooperation.—Results furnished by the Water Supply Commission of Pennsylvania.

Discharge measurements of West Branch of Susquehanna River at Williamsport, Pa., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 5	Boehringer and Batley	3.31	7,910
Sept. 12	R. H. Hosmer	.15	618

Daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., for 1913.

[J. R. Mundy, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.15	4.85	3.95	7.60	8.40	7.80	0.90	2.80	0.26	0.34	3.54	2.49
2	2.30	4.30	3.90	6.20	7.50	7.10	.90	2.40	.32	1.12	3.18	2.51
3	2.35	4.25	3.65	5.10	4.80	4.10	.80	1.80	.31	2.75	2.81	2.35
4	2.50	4.20	3.27	4.50	4.30	3.50	.80	1.50	.26	2.80	2.52	2.27
5	2.25	4.05	3.10	4.20	4.00	3.10	.80	1.30	.27	2.70	2.30	2.20
6	3.65	3.75	3.00	4.00	3.30	2.90	.90	1.20	.22	2.70	2.16	2.16
7	2.90	3.70	3.00	3.70	3.10	2.80	.90	1.20	.27	2.45	2.26	2.36
8	7.95	3.55	2.90	3.40	3.00	2.40	.80	1.10	.26	2.20	2.14	3.09
9	17.20	3.60	2.70	3.30	2.80	2.30	.80	1.00	.21	1.90	2.38	4.24
10	13.75	3.45	2.70	3.20	1.20	2.10	1.00	1.00	.19	1.08	8.32	4.01
11	10.55	3.45	2.80	3.10	1.20	2.00	1.20	1.00	.19	.61	9.82	3.98
12	8.40	3.40	3.10	3.10	.60	2.00	1.20	1.00	.16	.85	7.08	3.80
13	8.80	3.35	3.30	3.30	.50	1.90	1.50	.90	.16	.55	6.20	3.47
14	8.50	3.40	3.70	3.50	.50	1.90	1.70	.90	.18	.52	5.56	3.21
15	7.55	3.25	3.80	3.60	.40	1.80	1.80	.90	.16	.63	5.60	2.98
16	6.15	3.25	6.90	3.60	.70	1.70	1.70	.80	.15	.59	5.78	2.84
17	5.60	3.40	7.10	3.50	.80	1.70	1.70	.80	.16	.57	5.61	2.63
18	4.85	3.25	6.20	2.90	.70	1.70	2.00	.80	.11	.78	5.34	2.42
19	8.10	3.30	5.80	2.70	.70	1.50	2.00	1.10	.14	.82	4.90	2.32
20	8.05	3.25	5.30	2.70	.70	1.50	1.90	1.00	.18	1.23	4.44	2.20
21	8.75	3.25	5.10	2.60	.60	1.50	2.00	.90	.31	3.72	4.09	2.08
22	9.10	3.40	5.20	2.40	.80	1.50	1.80	.90	2.95	4.40	3.82	1.95
23	7.55	3.45	4.90	2.30	1.40	1.40	1.70	.70	2.35	3.33	3.63	1.86
24	7.30	3.40	4.80	2.10	2.20	1.20	2.10	.51	2.06	2.95	3.36	2.62
25	7.05	3.35	5.00	1.90	2.60	1.20	5.50	.48	.76	2.92	3.18	3.37
26	7.35	3.35	11.50	1.80	4.00	1.10	6.70	.57	.64	6.35	2.92	3.34
27	7.00	3.70	18.45	1.80	4.30	1.00	6.90	.52	.55	8.72	2.79	3.00
28	6.35	3.85	18.90	2.50	5.00	1.00	6.20	.51	.52	7.17	2.58	2.76
29	5.70	.....	15.10	11.40	12.40	1.00	5.00	.42	.41	5.72	2.47	2.68
30	5.35	.....	11.30	10.70	9.90	.90	3.90	.33	.32	4.63	2.42	2.56
31	5.00	.....	8.70	.....	8.30	.....	3.10	.30	.....	3.99	.....	2.40

[1] Revised value.

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Daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,340	13,000	9,520	25,900	30,200	27,000	1,630	6,020	576	688	8,210	5,200
2	4,720	10,800	9,360	19,000	25,400	23,400	1,630	4,970	659	2,050	7,110	5,280
3	4,840	10,600	8,560	14,000	12,800	10,000	1,440	3,500	644	5,880	6,050	4,840
4	5,230	10,400	7,380	11,500	10,800	8,090	1,440	2,830	576	6,020	5,280	4,640
5	4,600	9,860	6,870	10,400	9,690	6,870	1,440	2,410	590	5,750	4,720	4,470
6	8,560	8,870	6,580	9,690	7,470	6,300	1,630	2,210	522	5,750	4,370	4,370
7	6,300	8,710	6,580	8,710	6,870	6,020	1,630	2,210	590	5,100	4,620	4,870
8	27,700	8,240	6,300	7,780	6,580	4,970	1,440	2,010	576	4,470	4,320	6,840
9	101,000	8,400	5,750	7,470	6,020	4,720	1,440	1,820	508	3,740	4,920	10,500
10	66,800	7,940	5,750	7,170	2,210	4,220	1,820	1,820	482	1,970	29,700	9,720
11	42,500	7,940	6,020	6,870	2,210	3,980	2,210	1,820	482	1,110	38,100	9,620
12	30,200	7,780	6,870	6,870	1,090	3,980	2,210	1,820	445	1,540	23,300	9,030
13	32,300	7,620	7,470	7,470	930	3,740	2,830	1,630	445	1,010	19,000	8,000
14	30,700	7,780	8,710	8,090	930	3,740	3,270	1,630	470	962	16,100	7,200
15	25,700	7,320	9,030	8,400	775	3,500	3,500	1,630	445	1,140	16,200	6,520
16	18,800	7,320	22,400	8,400	1,260	3,270	3,270	1,440	432	1,070	17,100	6,130
17	16,200	7,780	23,400	8,090	1,440	3,270	3,270	1,440	445	1,040	16,300	5,570
18	13,000	7,320	19,000	6,300	1,260	3,270	3,980	1,440	382	1,400	15,100	5,020
19	28,500	7,470	17,200	5,750	1,260	2,830	3,980	2,010	420	1,480	13,200	4,770
20	28,300	7,320	14,900	5,750	1,260	2,830	3,740	1,820	470	2,270	11,300	4,470
21	32,100	7,320	14,000	5,490	1,090	2,830	3,980	1,630	644	8,770	10,000	4,170
22	34,000	7,780	14,500	4,970	1,440	2,830	3,500	1,630	6,440	11,200	9,100	3,880
23	25,700	7,940	13,200	4,720	2,620	2,620	3,270	1,260	4,840	7,560	8,490	3,640
24	24,400	7,780	12,800	4,220	4,470	2,210	4,220	946	4,120	6,440	7,660	5,340
25	23,200	7,620	13,600	3,740	5,490	2,210	15,800	899	1,370	6,360	7,110	7,690
26	24,600	7,620	48,800	3,500	9,690	2,010	21,400	1,040	1,160	19,700	6,360	7,590
27	22,900	8,710	114,000	3,500	10,800	1,820	22,400	962	1,010	31,900	5,990	6,580
28	19,700	9,200	119,000	5,230	13,600	1,820	19,000	946	962	23,800	5,440	5,910
29	16,700	.....	79,400	48,000	55,400	1,820	13,600	806	790	16,800	5,150	5,700
30	15,100	.....	47,400	43,500	38,600	1,630	9,360	674	659	12,100	5,020	5,390
31	13,600	.....	31,800	.....	29,600	.....	6,870	630	.....	9,660	.....	4,970

Monthly discharge of West Branch of Susquehanna River at Williamsport, Pa., for 1913.

[Drainage area, 5,670 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	102,000	4,340	24,300	4.29	4.95
February	13,000	7,320	8,440	1.49	1.55
March	131,000	5,750	23,100	4.07	4.69
April	48,000	3,500	10,700	1.89	2.11
May	55,400	775	9,780	1.72	1.98
June	27,000	1,630	5,260	.928	1.04
July	22,400	1,440	5,520	.974	1.12
August	6,020	630	1,870	.330	.38
September	6,440	382	1,070	.189	.21
October	34,600	688	6,730	1.19	1.37
November	39,300	4,320	11,200	1.98	2.21
December	10,500	3,640	6,070	1.07	1.23
The year	131,000	382	9,530	1.68	22.84

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JUNIATA RIVER AT NEWPORT, PA.

Location.—At the steel highway bridge about 800 feet east of the public square at Newport, a mile below Buffalo Creek, and about 12 miles above the mouth.

Records available.—March 21, 1899, to July 15, 1906; January 6, 1907, to December 31, 1913.

Drainage area.—3,380 square miles (revised).

Gage.—Chain, attached to the bridge.

Discharge measurements.—Made from the bridge.

Winter flow.—Affected by ice.

Channel and control.—Conditions of flow liable to change from year to year.

Accuracy.—Results good for high and medium stages; fair for low stages.

Cooperation.—Results furnished by the Water-Supply Commission of Pennsylvania.

The following discharge measurement was made by Boehringer and Reckord: July 21, 1913: Gage height, 3.16 feet; discharge, 1,170 second-feet.

Daily gage height, in feet, of Juniata River at Newport, Pa., for 1913.

[A. R. Bortel, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.75	4.55	4.26	6.16	5.07	6.82	3.48	3.10	2.90	3.45	4.35	4.20
2	4.60	4.65	4.51	5.61	4.82	5.97	3.28	2.98	2.92	3.52	4.06	4.04
3	5.25	4.60	4.26	5.31	4.62	5.37	3.38	2.98	2.82	4.10	4.16	4.32
4	5.95	4.40	4.16	5.16	4.42	4.92	3.28	2.98	2.88	3.86	3.85	4.18
5	5.75	4.35	4.06	4.96	4.29	4.67	3.23	3.02	2.90	4.08	3.72	3.92
6	5.30	4.15	4.06	4.76	4.22	4.47	3.08	2.99	2.90	3.72	3.68	3.85
7	5.10	3.85	3.94	4.56	4.12	4.29	3.08	3.30	2.90	3.60	3.65	4.15
8	5.95	3.70	3.78	4.41	4.02	4.07	3.53	3.05	2.92	3.41	4.52	5.38
9	9.75	3.63	3.76	4.26	3.97	4.09	3.53	3.15	3.05	3.29	3.84	5.60
10	8.40	3.80	3.81	4.18	3.92	3.96	3.50	3.10	3.32	3.24	7.05	5.26
11	6.90	4.15	3.96	4.16	3.79	3.82	3.43	3.02	3.10	3.16	8.88	4.81
12	6.90	4.15	4.01	4.31	3.77	3.71	3.56	3.02	2.98	3.16	6.38	4.64
13	7.80	3.95	4.11	4.56	3.77	3.65	3.40	3.00	2.90	3.24	5.38	4.41
14	7.15	3.70	4.76	4.61	3.75	3.57	3.40	3.00	2.90	3.21	5.40	4.32
15	6.30	3.80	5.86	4.66	3.67	3.57	3.26	3.00	2.90	3.35	4.70	4.18
16	5.75	3.65	6.36	4.81	3.67	3.49	3.33	3.00	2.80	3.31	4.52	4.35
17	5.65	3.75	5.81	5.01	3.77	3.45	3.26	2.90	2.85	3.22	4.56	4.00
18	5.95	3.75	5.36	5.04	3.77	3.45	3.18	2.80	2.90	3.46	5.12	4.20
19	5.60	3.75	4.96	4.86	3.62	3.49	3.06	3.00	2.90	3.12	5.21	3.84
20	5.70	3.70	4.76	4.66	3.59	3.37	3.08	2.90	2.95	3.90	4.88	3.80
21	5.45	3.70	4.66	4.51	3.57	3.47	3.14	2.90	3.25	4.58	4.65	3.75
22	5.35	3.75	4.66	4.36	3.55	3.45	3.06	3.02	4.14	5.20	4.42	3.78
23	5.05	4.05	4.56	4.20	3.62	3.52	3.10	3.00	3.52	4.66	4.25	3.72
24	5.05	4.25	4.41	4.11	4.02	3.37	3.25	2.90	3.51	4.16	4.12	4.25
25	5.30	3.90	4.26	4.04	4.62	3.37	3.25	2.92	3.24	4.58	4.25	4.85
26	5.15	3.80	4.56	4.01	4.87	3.49	3.22	2.89	3.11	5.92	4.12	5.09
27	5.00	3.70	10.15	4.01	4.72	3.62	3.25	2.72	3.60	9.31	3.86	5.26
28	4.90	4.00	12.51	5.36	10.77	3.87	3.12	2.94	3.01	7.45	3.84	4.92
29	4.75	.....	9.86	5.96	15.22	3.77	3.02	2.92	2.98	5.81	3.96	4.68
30	4.57	.....	8.36	5.46	10.32	3.52	3.01	2.88	3.14	5.02	4.05	4.55
31	4.53	.....	6.76	.....	7.77	.....	3.12	2.72	.....	4.58	.....	4.32

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Daily discharge, in second-feet, of Juniata River at Newport, Pa., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,060	4,490	3,690	9,410	5,990	11,600	1,860	1,140	825	1,800	3,940	3,530
2	4,630	4,770	4,380	7,650	5,260	8,790	1,470	949	856	1,940	3,170	3,120
3	6,540	4,630	3,690	6,720	4,690	6,910	1,660	949	709	3,270	3,430	3,850
4	8,730	4,070	3,430	6,260	4,130	5,550	1,470	949	796	2,690	2,660	3,490
5	8,090	3,940	3,170	5,660	3,770	4,830	1,380	1,010	825	3,220	2,370	2,890
6	6,690	3,400	3,170	5,080	3,580	4,270	1,110	964	825	2,370	2,290	2,660
7	6,080	2,660	2,880	4,520	3,320	3,770	1,110	1,500	825	2,110	2,220	3,400
8	8,730	2,330	2,510	4,100	3,070	3,200	1,960	1,060	856	1,720	4,410	6,940
9	23,100	2,180	2,460	3,690	2,950	3,240	1,960	1,230	1,060	1,490	2,640	7,620
10	17,500	2,550	2,570	3,480	2,830	2,920	1,900	1,140	1,540	1,390	12,400	6,570
11	11,900	3,400	2,920	3,430	2,530	2,600	1,760	1,010	1,140	1,250	19,400	5,220
12	11,900	3,400	3,040	3,830	2,480	2,350	2,030	1,010	949	1,250	10,100	4,740
13	15,200	2,900	3,300	4,520	2,480	2,220	1,700	980	825	1,390	6,940	4,100
14	12,800	2,330	5,080	4,660	2,440	2,050	1,700	980	825	1,340	7,000	3,850
15	9,870	2,550	8,440	4,800	2,260	2,050	1,430	980	825	1,600	4,910	3,490
16	8,090	2,220	10,100	5,230	2,260	1,880	1,560	980	680	1,520	4,410	3,940
17	7,780	2,440	8,280	5,810	2,480	1,800	1,430	825	752	1,360	4,520	3,020
18	8,730	2,440	6,880	5,900	2,480	1,800	1,280	825	825	1,820	6,140	3,530
19	7,620	2,440	5,660	5,370	2,150	1,880	1,080	980	825	1,180	6,410	2,640
20	7,930	2,330	5,080	4,800	2,090	1,640	1,110	825	902	2,780	5,430	2,550
21	7,160	2,330	4,800	4,380	2,050	1,840	1,220	825	1,410	4,570	4,770	2,440
22	6,840	2,440	4,800	3,960	2,000	1,800	1,080	1,010	3,370	6,380	4,130	2,510
23	5,930	3,140	4,520	3,530	2,150	1,940	1,140	980	1,940	4,800	3,660	2,370
24	5,930	3,660	4,100	3,300	3,070	1,640	1,410	825	1,920	3,430	3,320	3,080
25	6,690	2,780	3,690	3,120	4,690	1,640	1,410	856	1,390	4,570	3,660	5,340
26	6,230	2,550	4,520	3,040	5,400	1,880	1,360	810	1,160	8,630	3,320	6,050
27	5,780	2,330	24,800	3,040	4,970	2,150	1,410	592	2,110	21,200	2,690	6,570
28	5,490	3,020	35,600	6,880	27,500	2,710	1,180	887	996	13,900	2,640	5,550
29	5,060	.....	23,600	8,760	50,000	2,480	1,010	856	949	8,280	2,920	4,850
30	4,550	.....	17,400	7,190	25,500	1,940	966	796	1,220	5,840	3,140	4,490
31	4,430	.....	11,400	.....	15,100	.....	1,180	592	.....	4,570	.....	3,850

Monthly discharge of Juniata River at Newport, Pa., for 1913.

[Drainage area, 3,380 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
January	23,100	4,430	8,420	2.49	2.87
February	4,770	2,180	2,990	.885	.92
March	37,300	2,460	7,420	2.20	2.54
April	9,410	3,040	5,070	1.50	1.67
May	50,000	2,000	6,640	1.96	2.26
June	11,600	1,640	3,180	.941	1.05
July	2,030	966	1,430	.423	.49
August	1,500	592	946	.280	.32
September	3,370	680	1,140	.337	.38
October	21,200	1,180	3,990	1.18	1.36
November	21,600	2,220	4,970	1.47	1.64
December	7,620	2,370	4,150	1.23	1.42
The year	50,000	592	4,210	1.25	16.92

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PATUXENT RIVER BASIN.

PATUXENT RIVER NEAR BURTONSVILLE, MD.

Location.—At the Columbia turnpike bridge, 1½ miles northeast of Burtonsville and about 4 miles northwest of Laurel.

Records available.—July 21 to December 31, 1913; July 21, 1911, to June 15, 1912, records furnished by the United States Engineer Office.

Drainage area.—127 square miles.

Gage.—Vertical staff fastened to left side of bridge pier, read once daily.

Channel and control.—Banks overflow at stage of about 10 feet; control is a gravel bar about 300 feet below bridge; current is swift under bridge but sluggish below bridge to control; discharge measurements 1911 to 1914 indicate that control remained practically permanent.

Discharge measurements.—Made from bridge or by wading.

Winter flow.—Affected by ice.

Accuracy.—Results fair; stream fluctuates rapidly and one gage reading daily may not be an accurate index of the mean daily flow.

The following discharge measurement was made by G. C. Stevens:

July 21, 1913: Gage height, 0.50 foot; discharge, 43.5 second-feet.

Daily gage height, in feet, and discharge, in second-feet, of Patuxent River near Burtonsville, Md., for 1913.

[Columbus Brashears, observer.]

Day.	July.		August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	0.50	43	0.75	80	0.50	43	0.65	64	0.70	72
2	.....	.....	6.5	1,620	.70	72	.75	80	.60	57	.70	72
3	.....	.....	7.6	2,010	.65	64	1.25	158	.60	57	.70	72
4	.....	.....	.70	72	.65	64	.70	72	.60	57	.65	64
5	.....	.....	.65	64	.65	64	.65	64	.60	57	.65	64
6	.....	.....	.55	50	.60	57	.60	57	.60	57	.65	64
7	.....	.....	.50	43	.55	50	.55	50	.60	57	.65	64
8	.....	.....	.60	57	.55	50	.60	57	.60	57	.80	87
9	.....	.....	.60	57	.50	43	.55	50	.80	87	.75	80
10	.....	.....	.65	64	.50	43	.55	50	.88	99	.75	80
11	.....	.....	.....	200	.50	43	.55	50	.75	80	.70	72
12	.....	.....	1.5	203	.45	36	.60	57	.65	64	.70	72
13	.....	.....	.95	110	.45	36	.60	57	.60	57	.65	64
14	.....	.....	.75	80	.45	36	.55	50	.60	57	.65	64
15	.....	.....	.70	72	.45	36	.55	50	.60	57	.65	64
16	.....	.....	.65	64	.45	36	.50	43	1.45	194	.60	57
17	.....	.....	.65	64	.50	43	.50	43	1.6	222	.60	57
18	.....	.....	.65	64	.55	50	.55	50	.....	176	.60	57
19	.....	.....	.65	64	.55	50	.60	57	.....	141	.60	57
20	.....	.....	.60	57	.55	50	.90	102	.....	115	.60	57
21	0.50	43	.60	57	.55	50	.80	87	.75	80	.60	57
22	.48	40	.65	64	3.2	605	.65	64	.70	72	1.05	126
23	.48	40	1.7	242	.75	80	.60	57	.70	72	.85	94
24	.48	40	1.65	232	.60	57	.60	57	.65	64	.80	87
25	.50	43	.60	57	.55	50	1.60	222	.60	57	.85	94
26	.45	36	.55	50	.55	50	.55	50	.60	57	2.7	474
27	.45	36	.55	50	.50	43	.75	80	.60	57	1.1	134
28	.45	36	.55	50	.50	43	.70	72	.65	64	.90	102
29	.45	36	.50	43	.50	43	.70	72	.75	80	.85	94
30	.55	50	5.5	1,290	.50	43	.70	72	.70	72	.80	87
31	.50	43	1.55	212	.....	.....	.70	72	.....	.....	.80	87

NOTE.—No readings obtained Aug. 11 and Nov. 18–20. Discharge determined from a rating curve well defined between 10 and 1,000 second-feet. Discharge estimated Aug. 11 and interpolated Nov. 18–20.

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Monthly discharge of Patuxent River near Burtonsville, Md., for 1913.

[Drainage area, 127 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
July 21–31	50	36	40.3	0.317	0.13	A.
August	2,010	43	239	1.88	2.17	B.
September	605	36	68.9	.543	.61	B.
October	222	43	69.2	.545	.63	B.
November	222	57	82.9	.653	.73	B.
December	474	57	89.5	.705	.81	B.

POTOMAC RIVER BASIN.

POTOMAC RIVER AT POINT OF ROCKS, MD.

Location.—At the steel highway bridge at Point of Rocks, about one-third mile below Catoctin Creek and about 6 miles above Monocacy River.

Records available.—February 17, 1895, to December 31, 1913.

Drainage area.—9,650 square miles.

Gage.—Chain, attached to bridge. Datum constant since September 2, 1902; prior to this date datum was 0.45 foot higher than at present.

Channel and control.—Practically permanent. The control is a ledge a few hundred feet below the station, the ledge extending completely across the river except for one relatively unimportant channel.

Discharge measurements.—Made from the bridge.

Winter flow.—Little affected by ice.

Canal.—The Chesapeake & Ohio canal parallels the Potomac on the Maryland side. The average discharge of the canal is 75 to 100 second-feet. The discharge is not included in the following tables.

Accuracy.—Results excellent except at extreme low water, when measuring conditions are not good.

Discharge measurements of Potomac River at Point of Rocks, Md., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 13	Padgett and Batchelder	1.34	3,170
29	G. C. Stevens	.98	1,880

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Daily gage height, in feet, of Potomac River at Point of Rocks, Md., for 1913.

[G. H. Hickman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	2.8	1.45	5.2	2.5	9.4	2.8	1.55	0.85	1.15	2.5	2.2
2	4.4	2.7	1.4	4.6	2.3	6.0	2.5	1.65	.74	.....	2.1	1.95
3	6.4	2.8	1.5	4.1	2.2	5.1	1.8	1.85	.92	1.75	2.1	2.0
4	3.9	2.6	1.7	3.8	2.2	4.2	1.7	2.0	.79	1.45	1.95	2.0
5	3.9	2.6	1.65	3.8	2.2	5.6	1.75	1.85	.76	1.2	1.7	2.1
6	3.8	2.6	1.6	3.6	2.2	4.9	1.9	1.85	.78	1.4	1.6	2.0
7	3.6	2.5	1.55	3.0	2.1	4.0	2.0	1.8	.79	1.1	1.55	2.5
8	3.9	2.4	1.55	3.0	2.0	3.2	1.9	1.65	.74	1.05	1.45	3.2
9	5.7	2.5	1.55	2.8	2.0	3.3	1.95	1.6	.89	1.05	1.75	4.1
10	5.3	2.6	1.6	2.8	1.8	2.9	1.6	1.45	.74	1.1	8.9	3.8
11	4.4	2.4	1.55	2.8	1.85	3.1	1.5	1.35	.63	1.05	9.7	3.1
12	4.4	2.5	1.5	2.7	1.7	2.9	2.9	1.45	.66	.84	5.9	2.7
13	4.0	2.3	2.0	3.3	1.65	2.8	2.5	1.3	.73	1.95	4.4	2.6
14	3.9	2.3	3.1	5.0	1.6	2.6	2.3	1.2	.74	1.8	3.2	2.5
15	3.4	2.3	4.9	6.1	1.75	2.3	1.9	1.25	.48	1.6	3.3	2.4
16	3.0	2.2	6.4	6.8	1.6	2.0	1.7	1.25	.78	1.4	4.5	2.2
17	2.9	2.1	6.9	10.8	1.85	2.0	1.55	1.0	.64	1.35	6.2	2.2
18	2.8	2.0	5.2	8.1	2.0	2.7	1.9	1.4	.78	1.4	6.2	1.95
19	3.0	1.95	4.4	5.6	2.3	2.2	2.0	1.6	.74	.93	5.4	1.9
20	2.9	1.95	3.8	5.1	2.4	1.5	1.9	1.2	.89	1.25	5.6	1.8
21	2.6	1.9	3.3	4.5	2.3	1.25	1.8	1.15	.93	1.5	4.4	1.75
22	2.5	1.85	3.2	4.0	2.3	1.45	1.7	1.05	1.2	2.5	3.4	1.9
23	2.4	1.85	2.8	3.6	2.2	1.6	1.55	1.35	1.3	2.9	2.8	2.0
24	2.4	1.85	2.8	3.2	3.0	1.55	1.5	1.2	1.35	2.7	2.4	2.0
25	2.3	1.85	2.2	3.0	9.2	1.35	1.55	1.1	1.65	2.6	3.5	1.95
26	2.5	1.65	2.4	2.9	6.9	2.1	1.4	1.05	1.45	4.5	2.6	2.1
27	2.6	1.55	5.8	3.0	5.2	2.7	1.45	1.1	1.2	8.4	2.3	5.7
28	2.7	1.5	17.5	3.0	10.5	1.55	1.4	1.1	.98	5.9	2.2	4.9
29	2.8	.....	16.0	3.0	11.3	2.3	1.35	1.05	.98	4.4	2.1	4.4
30	2.6	.....	9.5	2.8	7.7	3.0	1.3	.88	.99	3.4	2.1	3.8
31	2.6	.....	6.3	.....	6.0	.....	1.35	.86	.....	2.8	.....	3.4

Daily discharge, in second-feet, of Potomac River at Point of Rocks, Md., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	13,000	8,180	3,240	21,100	6,920	50,800	8,180	3,540	1,610	2,380	6,920	5,750
2	16,300	7,750	3,090	17,400	6,130	26,100	6,920	3,860	1,340	3,270	5,380	4,840
3	28,800	8,180	3,390	14,600	5,750	20,400	4,330	4,500	1,790	4,160	5,380	5,020
4	13,500	7,330	4,010	13,000	5,750	15,200	4,010	5,020	1,460	3,240	4,840	5,020
5	13,500	7,330	3,860	13,000	5,750	23,600	4,170	4,500	1,390	2,520	4,010	5,380
6	13,000	7,330	3,700	12,000	5,750	19,200	4,670	4,500	1,440	3,090	3,700	5,020
7	12,000	6,920	3,540	9,070	5,380	14,100	5,020	4,330	1,460	2,250	3,540	6,920
8	13,500	6,520	3,540	9,070	5,020	10,000	4,670	3,860	1,340	2,120	3,240	10,000
9	24,200	6,920	3,540	8,180	5,020	10,500	4,840	3,700	1,710	2,120	4,170	14,600
10	21,700	7,330	3,700	8,180	4,330	8,620	3,700	3,240	1,340	2,250	46,800	13,000
11	16,300	6,520	3,540	8,180	4,500	9,530	3,390	2,940	1,080	2,120	53,200	9,530
12	16,300	6,920	3,390	7,750	4,010	8,620	8,620	3,240	1,150	1,580	25,500	7,750
13	14,100	6,130	5,020	10,500	3,860	8,180	6,920	2,800	1,310	4,840	16,300	7,330
14	13,500	6,130	9,530	19,800	3,700	7,330	6,130	2,520	1,340	4,330	10,000	6,920
15	11,000	6,130	19,200	26,800	4,170	6,130	4,670	2,660	748	3,700	10,500	6,520
16	9,070	5,750	28,800	31,500	3,700	5,020	4,010	2,660	1,440	3,090	16,800	5,750
17	8,620	5,380	32,100	62,200	4,500	5,020	3,540	1,990	1,100	2,940	27,500	5,750
18	8,180	5,020	21,100	40,700	5,020	7,750	4,670	3,090	1,440	3,090	27,500	4,840
19	9,070	4,840	16,300	23,600	6,130	5,750	5,020	3,700	1,340	1,810	22,300	4,670
20	8,620	4,840	13,000	20,400	6,520	3,390	4,670	2,520	1,710	2,660	23,600	4,330
21	7,330	4,670	10,500	16,800	6,130	2,660	4,330	2,380	1,810	3,390	16,300	4,170
22	6,920	4,500	10,000	14,100	6,130	3,240	4,010	2,120	2,520	6,920	11,000	4,670
23	6,520	4,500	8,180	12,000	5,750	3,700	3,540	2,940	2,800	8,620	8,180	5,020
24	6,520	4,500	8,180	10,000	9,070	3,540	3,390	2,520	2,940	7,750	6,520	5,020
25	6,130	4,500	5,750	9,070	49,200	2,940	3,540	2,250	3,860	7,330	11,500	4,840
26	6,920	3,860	6,520	8,620	32,100	5,380	3,090	2,120	3,240	16,800	7,330	5,380
27	7,330	3,540	24,800	9,070	21,100	7,750	3,240	2,250	2,520	43,000	6,130	24,200
28	7,750	3,390	118,000	9,070	59,800	3,540	3,090	2,250	1,940	25,500	5,750	19,200
29	8,180	.....	105,000	9,070	66,400	6,130	2,940	2,120	1,940	16,300	5,380	16,300
30	7,330	.....	51,600	8,180	37,800	9,070	2,800	1,680	1,960	11,000	5,380	13,000
31	7,330	.....	28,100	.....	26,100	.....	2,940	1,640	.....	8,180	.....	11,000

NOTE.—Discharge determined from a rating curve well defined except at extreme low stages.

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Monthly discharge of Potomac River at Point of Rocks, Md., for 1913.

[Drainage area, 9,650 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	28,800	6,130	11,700	1.21	1.40	A.
February	8,180	3,390	5,890	.610	.64	A.
March	118,000	3,090	18,200	1.89	2.18	A.
April	62,200	7,750	16,100	1.67	1.86	A.
May	66,400	3,700	13,600	1.41	1.63	A.
June	50,800	2,660	10,400	1.08	1.20	A.
July	8,620	2,800	4,490	.465	.54	A.
August	5,020	1,640	3,010	.312	.36	A.
September	3,860	748	1,770	.183	.20	B.
October	43,000	1,580	6,850	.710	.82	A.
November	53,200	3,240	13,500	1.40	1.56	A.
December	24,200	4,170	8,120	.841	.97	A.
The year	118,000	748	9,490	.983	13.36	

MONOCACY RIVER NEAR FREDERICK, MD.

Location.—At the county bridge on the toll road leading from Frederick to Mount Pleasant, Md., about 3,000 feet below Tuscarora Creek (entering from the right) and about 2,000 feet above Israel Creek (entering from the left).

Records available.—August 4, 1896, to December 31, 1913.

Drainage area.—660 square miles.

Gage.—Chain attached to downstream side of right span of the bridge.

Channel and control.—Banks lined with trees and brush and overflow at high stages. Control composed of gravel and bowlders, shifting during extreme floods.

Discharge measurements.—Made from the bridge or by wading.

Winter flow.—Affected by ice only during severe winters.

Accuracy.—Results fair.

Discharge measurements Monocacy River near Frederick, Md., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Aug. 14	Padgett and Batchelder	3.99	166	Aug. 28	G. C. Stevens	3.67	76.0
28	G. C. Stevens	3.67	75.8				

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Daily gage height, in feet, of Monocacy River near Frederick, Md., for 1913.

[Eugene L. Derr, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.9	6.5	5.9	7.2	.....	5.6	4.4	5.4	4.05	7.8	5.15	5.15
2	8.5	6.1	5.5	6.5	.....	5.4	4.4	7.8	4.05	8.7	4.95	5.05
3	10.5	5.8	5.4	6.9	.....	5.2	4.3	5.1	3.95	5.85	4.85	4.95
4	8.9	6.7	5.1	6.7	.....	5.1	4.3	4.8	3.85	5.35	4.85	4.95
5	8.1	6.6	5.1	6.5	5.3	5.0	4.3	4.4	3.85	4.85	4.75	4.85
6	7.9	5.7	5.0	6.4	5.1	4.9	4.6	4.2	3.85	4.55	4.75	4.85
7	7.3	5.6	4.9	6.2	5.1	4.9	4.5	4.0	3.85	4.35	4.65	8.0
8	8.7	5.6	4.7	5.9	5.1	4.8	4.4	4.0	3.85	4.35	4.65	7.8
9	7.5	5.5	4.7	5.7	5.0	4.8	4.3	4.0	3.75	4.25	5.15	6.2
10	6.5	5.4	4.7	5.6	4.9	4.7	4.3	4.0	3.75	4.25	5.75	5.95
11	6.4	5.4	6.7	5.6	4.9	4.7	4.3	5.0	3.75	4.55	5.25	5.75
12	8.1	5.3	5.9	10.0	4.9	4.7	4.3	4.9	3.75	4.95	5.15	5.55
13	7.2	4.6	5.6	9.9	4.9	4.6	4.3	4.8	3.75	4.75	5.05	5.35
14	6.1	4.5	16.0	9.7	4.9	4.5	4.3	4.2	3.75	4.35	4.95	5.25
15	5.9	5.3	11.2	10.5	4.9	4.5	4.3	4.15	3.75	4.25	4.95	5.15
16	6.4	5.2	12.5	9.2	4.9	4.5	4.3	4.15	3.75	4.15	6.8	5.05
17	8.2	5.2	8.6	8.5	5.0	4.5	4.2	4.05	3.75	4.15	8.0	4.95
18	7.1	5.1	7.1	7.1	5.3	4.4	4.2	4.05	3.75	4.15	5.95	4.85
19	6.9	5.2	6.7	6.9	5.1	4.4	4.2	4.05	3.85	4.15	5.85	4.85
20	6.4	5.2	6.5	6.4	4.9	4.4	4.2	5.05	4.05	4.45	5.65	4.75
21	6.2	5.3	6.4	6.3	4.9	4.4	4.1	4.35	5.6	4.85	5.35	4.75
22	6.2	5.7	6.2	5.9	4.9	5.5	4.1	4.25	10.6	4.95	5.25	4.75
23	6.1	6.3	5.9	5.8	5.9	4.6	4.0	4.25	5.75	4.85	5.15	6.4
24	6.1	5.8	5.8	5.8	6.9	4.6	4.0	4.15	4.55	4.75	4.95	10.8
25	6.0	5.4	5.8	5.8	6.5	4.6	3.9	4.15	5.35	13.6	4.85	10.2
26	6.0	5.2	6.9	5.8	5.5	4.7	3.9	4.15	4.15	12.2	4.75	13.6
27	6.0	5.2	18.5	5.8	7.5	4.6	3.8	4.05	4.05	9.2	4.75	8.8
28	6.4	5.7	18.7	7.2	7.4	4.5	3.9	4.05	4.05	8.2	4.75	8.0
29	6.3	.....	9.1	6.2	6.9	4.4	3.9	4.05	3.95	5.85	5.25	6.8
30	6.3	.....	8.5	6.1	6.4	4.4	3.9	4.15	3.95	5.55	5.15	5.95
31	6.2	.....	7.5	.....	6.2	.....	4.9	4.05	.....	5.25	.....	5.55

NOTE.—Gage out of repair May 1–4.

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Daily discharge, in second-feet, of Monocacy River near Frederick, Md., for 1912–13.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	3,800	643	1,960	2,040	1,180	331	331	259	139	1,050	167	167
2	1,960	643	1,470	1,880	695	294	259	331	139	749	167	167
3	1,180	643	983	2,860	593	259	227	227	139	498	197	197
4	1,050	593	805	1,320	545	259	227	197	227	453	197	259
5	922	643	593	1,180	498	259	259	139	197	411	197	259
6	805	.....	695	1,110	498	259	227	167	167	370	197	498
7	.....	.....	805	983	1,110	259	227	139	167	331	197	1,300
8	.....	.....	1,110	2,580	983	259	197	139	197	294	1,960	411
9	.....	.....	1,250	1,470	1,320	259	167	259	167	294	1,050	370
10	.....	.....	1,180	1,180	1,110	227	139	259	139	259	453	331
11	.....	.....	1,050	1,050	695	197	167	3,420	139	259	453	259
12	.....	.....	883	749	883	197	259	2,860	113	259	370	197
13	.....	.....	7,780	749	1,180	197	498	1,470	68	259	294	139
14	.....	.....	8,100	1,470	695	197	370	331	68	227	259	139
15	.....	.....	11,900	922	695	197	259	227	68	227	227	197
16	.....	.....	14,000	1,620	695	370	227	227	68	197	227	197
17	.....	.....	4,000	1,540	1,960	331	227	197	68	197	227	197
18	.....	498	2,860	1,880	1,470	294	2,950	197	68	197	197	227
19	.....	453	2,580	1,620	695	294	2,040	197	113	197	197	545
20	.....	1,620	2,400	1,110	498	294	370	197	89	197	197	498
21	.....	1,960	3,040	983	545	259	370	294	89	197	197	453
22	.....	13,000	2,670	805	498	227	1,050	227	89	227	197	453
23	.....	3,330	1,960	749	453	227	643	197	126	259	197	453
24	.....	1,620	7,160	643	411	227	593	197	1,540	331	197	498
25	.....	1,180	6,240	593	411	453	863	197	17,400	331	197	593
26	.....	8,420	3,800	593	370	453	593	167	13,000	259	197	643
27	.....	9,780	2,760	863	294	2,130	411	139	2,310	227	197	1,050
28	593	3,800	1,880	805	294	695	331	139	1,960	227	197	1,320
29	593	3,240	12,500	749	294	453	259	139	1,470	227	167	863
30	593	.....	5,140	1,470	370	370	331	139	1,180	197	167	4,850
31	593	.....	2,860	.....	370	.....	294	139	.....	167	.....	9,360
1913.												
1	3,240	1,180	805	1,700	837	643	167	545	78	2,220	432	432
2	2,860	922	593	1,180	752	545	167	2,220	78	3,040	350	390
3	4,760	749	545	1,470	667	453	139	411	59	777	312	350
4	3,240	1,320	411	1,320	582	411	139	294	43	522	312	350
5	2,490	1,250	411	1,180	498	370	139	167	43	312	276	312
6	2,310	695	370	1,110	411	331	227	113	43	212	276	312
7	1,790	643	331	983	411	331	197	68	43	153	243	2,400
8	3,040	643	259	805	411	294	167	68	43	153	243	2,220
9	1,960	593	259	695	370	294	139	68	30	126	432	963
10	1,180	545	259	643	331	259	139	68	30	126	722	534
11	1,110	545	1,320	643	331	259	139	370	30	212	476	722
12	2,490	498	805	4,280	331	259	139	331	30	350	432	618
13	1,700	227	643	4,180	331	227	139	294	30	276	390	522
14	922	197	10,400	4,000	331	197	139	113	30	153	350	476
15	805	498	5,440	4,760	331	197	139	101	30	126	350	432
16	1,110	453	6,740	3,520	331	197	139	101	30	101	1,390	390
17	2,580	453	2,950	2,860	370	197	113	78	30	101	2,400	350
18	1,620	411	1,620	1,620	498	167	113	78	30	101	834	312
19	1,470	453	1,320	1,470	411	167	113	78	43	101	777	312
20	1,110	453	1,180	1,110	331	167	113	390	78	182	669	276
21	983	498	1,110	1,050	331	167	89	153	643	312	522	276
22	983	695	983	805	331	593	89	126	4,850	350	476	276
23	922	1,050	805	749	805	227	68	126	722	312	432	1,110
24	922	749	749	749	1,470	227	68	101	212	276	350	5,040
25	863	545	749	749	1,180	227	50	101	522	7,890	312	4,470
26	863	453	1,470	749	593	259	50	101	101	6,440	276	7,890
27	863	453	13,000	749	1,960	227	36	78	78	3,520	276	3,140
28	1,110	695	13,200	1,700	1,880	197	50	78	78	2,580	276	2,400
29	1,050	.....	3,420	983	1,470	167	50	78	59	777	476	1,390
30	1,050	.....	2,860	922	1,110	167	50	101	59	618	432	534
31	983	.....	1,960	.....	983	.....	331	78	.....	476	.....	618

NOTE.—Discharge determined from a rating curve fairly well defined for 1912; well defined between 50 and 140 second-feet and fairly well defined above 140 second-feet for 1913. Mean discharge Jan. 7–27, 1912, estimated at 600 second-feet; Feb. 6–17, 1912, at 450 second-feet. Discharge interpolated May 1–4, 1913. Discharges for 1912 supersede those published in Water-Supply Paper 321, pp. 222–223.

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Monthly discharge of Monocacy River near Frederick, Md., for 1912–13.

[Drainage area, 660 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1912.						
January	3,800	.....	796	1.21	1.40	D.
February	13,000	.....	1,980	3.00	3.24	D.
March	14,000	593	3,750	5.68	6.55	B.
April	2,860	593	1,250	1.89	2.11	B.
May	1,960	294	719	1.09	1.26	B.
June	2,130	197	358	.542	.60	B.
July	2,950	139	496	.750	.86	B.
August	3,420	139	433	.656	.76	B.
September	17,400	68	1,390	2.11	2.35	B.
October	1,050	167	309	.468	.54	B.
November	1,960	167	311	.471	.52	B.
December	9,360	139	877	1.33	1.53	B.
The year	17,400	68	1,050	1.59	21.72	
1913.						
January	4,760	805	1,690	2.56	2.95	B.
February	1,320	197	638	.967	1.01	C.
March	13,200	259	2,480	3.76	4.34	B.
April	4,760	643	1,620	2.45	2.73	B.
May	1,960	331	677	1.03	1.19	B.
June	643	167	281	.426	.48	B.
July	331	36	124	.188	.22	A.
August	2,220	68	228	.345	.40	B.
September	4,850	30	272	.412	.46	B.
October	7,990	101	1,060	1.61	1.86	B.
November	2,400	243	516	.782	.87	B.
December	7,890	276	1,300	1.97	2.27	B.
The year	13,200	30	913	1.38	18.69	

OCCOQUAN CREEK NEAR OCCOQUAN, VA.

Location.—At Frank Davis's farm, about half a mile above Beaverdam Creek, and about 4½ miles upstream and northwest of Occoquan.

Records available.—February 14 to December 31, 1913.

Drainage area.—546 square miles.

Gage.—Friez automatic on left bank installed April 27, 1913, referred to an inclined staff on left bank about 150 feet upstream. Previous to this date a temporary vertical staff on opposite bank.

Channel and control.—Large rocks; practically permanent.

Discharge measurements.—Made from cable about 75 feet below the automatic gage, or by wading.

Winter flow.—Affected by ice.

Accuracy.—Results good.

Discharge measurements of Occoquan Creek near Occoquan, Va., during 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 10	G. C. Stevens	2.62	117	July 7	M. I. Walters	2.14	64.4
27	Stevens and Walters	4.06	517	14	Batchelder and Walters	1.96	38.6
June 3	G. C. Stevens	3.34	280	22	C. L. Batchelder	1.94	37.0
5	M. I. Walters	3.02	208	Aug. 27	J. G. Mathers	1.59	16.8
21	Mathers and Padgett	2.23	60.2				

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Daily gage height, in feet, of Occoquan Creek near Occoquan, Va., for 1913.

[W. V. Davis and Sadie Bradley, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	3.17	4.0	3.07	.....	2.24	1.96	1.63	6.0	2.28	2.52
2	.....	.....	2.89	3.62	2.96	.....	2.17	4.25	1.59	3.21	2.20	2.47
3	.....	.....	2.75	3.44	2.91	3.35	2.16	2.81	1.55	3.04	2.15	2.43
4	.....	.....	2.65	3.36	.....	.....	2.17	2.37	1.52	2.52	2.10	2.40
5	.....	.....	2.59	3.33	.....	3.02	.....	2.09	1.50	2.22	2.05	2.33
6	.....	.....	2.58	3.25	.....	.....	.....	1.98	1.49	2.07	2.00	2.26
7	.....	.....	2.53	3.07	.....	.....	2.13	1.91	1.49	1.92	2.00	2.27
8	.....	.....	2.47	2.99	.....	.....	2.01	1.86	1.48	1.82	2.00	2.29
9	.....	.....	2.41	2.91	.....	.....	1.96	1.85	1.48	1.80	2.10	2.35
10	.....	.....	2.43	2.87	2.60	.....	2.07	1.82	1.45	1.80	3.01	2.35
11	.....	.....	2.65	2.85	2.55	.....	2.05	1.92	1.44	1.79	2.88	2.24
12	.....	.....	3.44	14.2	2.50	2.57	1.98	2.02	1.41	1.74	2.59	2.19
13	.....	.....	3.03	16.6	2.49	.....	1.99	2.10	1.39	1.83	2.43	2.15
14	.....	3.2	11.5	11.3	2.53	.....	1.96	2.03	1.39	2.04	2.34	2.13
15	.....	2.92	10.2	6.8	2.59	.....	1.93	1.99	1.39	1.93	2.23	2.11
16	.....	2.91	8.2	8.7	2.65	2.40	1.96	1.99	1.39	1.88	2.60	2.05
17	.....	2.88	5.45	9.2	.....	.....	1.95	1.95	1.39	1.83	5.1	2.07
18	.....	2.91	4.55	5.45	.....	2.40	1.97	1.90	1.39	1.80	3.64	2.06
19	.....	2.87	4.15	4.9	.....	2.31	2.00	1.89	1.41	1.82	3.15	2.07
20	.....	2.79	4.15	4.15	.....	2.26	2.04	1.83	1.45	1.90	2.92	2.06
21	.....	2.81	5.1	3.87	.....	2.23	2.07	1.78	1.72	2.58	2.74	2.07
22	.....	2.88	4.55	3.79	.....	2.25	1.93	1.74	4.8	2.34	2.56	2.08
23	.....	2.88	3.88	3.69	.....	2.29	1.91	1.74	2.94	2.13	2.49	2.05
24	.....	2.79	3.59	3.57	.....	2.27	1.83	1.74	2.40	2.07	2.38	2.21
25	.....	2.69	3.51	3.45	.....	2.45	1.90	1.73	2.09	3.79	2.29	2.92
26	.....	2.61	3.56	3.33	.....	3.41	1.95	1.69	1.94	5.8	2.26	2.6
27	.....	2.63	10.0	3.27	4.1	3.11	1.87	1.60	1.82	3.71	2.21	6.0
28	.....	2.79	6.8	3.48	.....	2.61	1.89	1.59	1.74	3.04	2.23	4.2
29	.....	.....	4.9	3.37	.....	2.45	2.01	1.58	1.71	2.73	2.31	3.69
30	.....	.....	4.35	3.19	.....	2.32	1.88	1.59	1.70	2.51	2.46	3.47
31	.....	.....	4.45	.....	.....	.....	1.85	1.68	.....	2.38	.....	3.22

NOTE.—Temporary staff gage used Feb. 14 to Apr. 26. Beginning Apr. 27 records are from automatic gage, except for May 27, June 3, 5, 12, 16, and 18, which were read on staff gages.

Daily discharge, in second-feet, of Occoquan Creek near Occoquan, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	241	500	216	360	65	38	19	1,460	70	103
2	.....	.....	174	371	189	340	57	590	17	252	60	96
3	.....	.....	144	317	178	290	56	156	15	208	55	90
4	.....	.....	125	293	170	246	57	81	14	103	50	85
5	.....	.....	114	284	161	203	56	49	13	62	46	76
6	.....	.....	113	262	152	175	54	40	13	47	41	67
7	.....	.....	105	216	143	225	53	35	13	35	41	68
8	.....	.....	96	196	134	200	42	32	12	29	41	71
9	.....	.....	86	178	125	175	38	31	12	28	50	78
10	.....	.....	90	169	116	155	47	29	12	28	200	78
11	.....	.....	125	165	108	135	46	35	11	27	172	65
12	.....	.....	317	10,100	100	111	40	43	10	24	114	59
13	.....	.....	206	13,600	98	104	40	50	9.7	30	90	55
14	.....	249	6,570	6,330	105	98	38	44	9.7	45	77	53
15	.....	180	5,080	2,080	114	91	36	40	9.7	36	64	51
16	.....	178	3,210	3,660	125	85	38	40	9.7	33	116	46
17	.....	172	1,200	4,110	115	85	38	38	9.7	30	965	47
18	.....	178	718	1,200	135	85	39	34	9.7	28	377	46
19	.....	169	552	895	115	73	41	33	10	29	236	47
20	.....	152	552	552	115	67	45	30	12	34	180	46
21	.....	156	1,000	454	100	64	47	27	23	113	142	47
22	.....	172	718	426	115	66	36	24	840	77	110	48
23	.....	172	458	392	6,000	71	35	24	185	53	98	48
24	.....	152	362	356	13,000	68	30	24	85	47	82	253
25	.....	132	338	320	6,000	92	34	24	49	422	71	467
26	.....	118	353	284	2,200	308	38	22	37	1,340	67	4,030
27	.....	121	4,880	267	535	226	32	17	29	398	61	1,460
28	.....	152	2,080	329	700	118	33	17	24	208	64	565
29	.....	.....	895	296	790	92	42	16	23	140	73	382
30	.....	.....	630	246	500	75	33	17	22	102	94	326
31	.....	.....	672	.....	430	.....	31	21	.....	82	.....	254

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated May 4-9, June 4, 13-15, and July 5-6. Discharge May 17-26, May 28 to June 2, and June 6-11, estimated from rainfall records.

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Monthly discharge of Occoquan Creek near Occoquan, Va., for 1913.

[Drainage area, 546 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
February 14-28	249	118	164	0.300	0.17	A.
March	6,570	86	1,040	1.90	2.19	A.
April	13,600	165	1,630	2.99	3.34	B.
May	13,000	98	1,070	1.96	2.26	C.
June	360	64	149	.273	.30	B.
July	65	31	42.5	.078	.09	A.
August	590	16	54.9	.101	.12	A.
September	840	9.7	51.9	.095	.11	B.
October	1,460	24	179	.328	.38	A.
November	965	41	130	.238	.27	A.
December	4,480	46	312	.571	.66	A.

NOTE.—See footnotes to table of daily discharge.

RAPPAHANNOCK RIVER BASIN.

RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA.

Location.—About 3½ miles above Fredericksburg, and about 1½ miles above the dam of the Spottsylvania Power Co.

Records available.—September 19, 1907, to December 31, 1913.

Drainage area.—1,590 square miles.

Gage.—Vertical staff installed November 4, 1913, to replace chain gage destroyed October 31, 1913. Original gage was a vertical staff, which was destroyed February 14, 1908, and replaced February 20, 1908, by a chain gage under the cable. All three gages were referred to the same datum and the locations were practically the same.

Channel and control.—Practically permanent. Current sluggish at extreme low water.

Discharge measurements.—Made from cable at the gage. At extreme low water measurements can be made by wading or from a bridge over the power canal.

Winter flow.—Not often affected by ice.

Accuracy.—Results good.

Discharge measurements of Rappahannock River near Fredericksburg, Va., during 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 3	G. C. Stevens [a]	0.64	166
10	....do	.56	[b] 132

[a] Assisted by Cecil L. Reid, engineer for Spottsylvania Power Co.
[b] Discharge is mean of four discharge measurements made on power canal just below dam. Entire flow of river was diverted into power canal.

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Daily gage height, in feet, of Rappahannock River near Fredericksburg, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.7	2.25	1.85	2.6	2.15	3.2	1.75	1.08	0.61	0.68	.....	1.5
2	2.9	2.15	1.75	2.4	2.1	2.8	1.6	1.20	.59	1.8	.....	1.47
3	3.1	2.05	1.65	2.3	2.05	2.5	3.4	1.02	.64	1.13	.....	1.44
4	4.0	3.0	1.6	2.25	2.0	4.5	2.1	.98	.61	.99	1.16	1.44
5	3.2	2.8	1.6	2.35	2.7	4.1	1.65	.99	.58	.93	1.15	1.40
6	2.7	2.5	1.6	2.2	2.1	3.0	1.6	.93	.58	.84	1.11	1.36
7	2.5	2.35	1.55	2.05	1.95	2.8	1.9	.92	.64	.78	1.04	1.39
8	2.5	2.15	1.48	2.0	1.9	2.7	1.65	.84	.64	.73	1.06	1.34
9	2.45	2.1	1.5	2.0	1.85	2.6	1.5	.88	.51	.70	1.16	1.42
10	2.3	2.05	1.55	1.95	1.9	2.4	1.55	.94	.57	.76	3.9	1.34
11	2.2	2.0	1.85	1.9	1.75	2.15	2.3	.91	.51	.81	2.5	1.31
12	2.15	2.0	2.15	7.3	1.65	2.05	2.25	.98	.48	1.01	2.05	1.36
13	2.15	1.95	2.15	9.8	1.75	2.0	1.8	1.12	.70	1.01	1.8	1.22
14	2.0	1.8	6.2	6.5	1.7	1.9	1.7	1.19	.58	.92	1.7	1.24
15	1.95	1.75	7.4	4.6	1.75	1.8	1.5	1.19	.60	.87	1.6	1.24
16	1.9	1.75	5.1	4.5	1.8	1.75	1.41	1.08	.62	.79	1.65	1.24
17	1.9	1.8	4.1	4.9	2.0	1.7	1.36	1.02	.58	.74	1.85	1.36
18	1.9	1.8	3.3	4.0	1.9	1.65	1.39	.94	.64	.76	1.9	1.24
19	1.9	1.75	3.0	3.5	1.85	1.6	1.46	.88	.66	.83	1.7	1.14
20	1.85	1.7	2.9	3.2	1.75	1.55	1.42	.90	.64	.88	1.55	1.20
21	1.8	1.75	2.8	2.9	1.75	1.55	1.34	1.19	.84	1.34	1.55	1.20
22	1.75	1.75	2.8	2.8	1.65	1.55	1.55	1.13	1.65	1.6	1.5	1.18
23	1.75	1.75	2.7	2.7	2.15	1.5	1.30	.97	1.7	1.27	1.44	1.18
24	1.9	1.7	2.4	2.6	9.3	1.7	1.21	.98	1.13	1.18	1.38	1.9
25	2.3	1.65	2.35	2.5	5.0	2.15	1.17	.88	.92	2.3	1.31	2.1
26	2.6	1.6	2.3	2.45	3.2	3.0	1.22	.84	.82	2.7	1.25	4.4
27	2.25	1.65	3.2	2.4	2.7	2.8	1.18	.80	.73	2.2	1.34	3.5
28	3.7	1.75	4.1	2.4	4.2	2.9	1.13	.73	.71	1.8	1.35	2.8
29	2.9	.....	3.5	2.4	3.8	2.15	1.08	.70	.70	1.55	1.5	2.3
30	2.5	.....	3.0	2.25	3.25	1.9	1.09	.70	.64	1.42	1.6	2.1
31	2.35	.....	2.8	.....	3.6	.....	1.11	.66	.....	1.20	.....	2.0

NOTE.—Gage was destroyed on Oct. 31 and replaced Nov. 4.

Daily discharge, in second-feet, of Rappahannock River near Fredericksburg, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,370	1,700	1,160	2,240	1,560	3,290	1,040	382	148	172	462	750
2	2,740	1,560	1,040	1,920	1,480	2,570	860	470	141	1,100	455	718
3	3,100	1,420	918	1,770	1,420	2,080	3,700	342	158	418	448	667
4	5,100	2,920	860	1,700	1,350	6,480	1,480	317	148	323	440	667
5	3,290	2,570	860	1,840	2,400	5,360	918	323	138	288	432	645
6	2,400	2,080	860	1,620	1,480	2,920	860	288	138	240	402	607
7	2,080	1,840	805	1,420	1,280	2,570	1,220	282	158	212	355	636
8	2,080	1,560	729	1,350	1,220	2,400	918	240	158	191	369	588
9	2,000	1,480	750	1,350	1,160	2,240	750	260	118	179	440	606
10	1,770	1,420	805	1,280	1,220	1,920	805	294	135	204	4,850	588
11	1,620	1,350	1,160	1,220	1,040	1,560	1,770	276	118	225	2,080	560
12	1,560	1,350	1,560	17,200	918	1,420	1,700	317	110	336	1,420	518
13	1,560	1,280	1,560	29,800	1,040	1,350	1,100	410	179	336	1,100	488
14	1,350	1,100	12,400	13,700	975	1,220	975	462	138	282	975	502
15	1,280	1,040	17,700	6,770	1,040	1,100	750	462	144	255	860	502
16	1,220	1,040	8,340	6,480	1,100	1,040	656	382	151	216	918	502
17	1,220	1,100	5,360	7,690	1,350	975	607	342	138	195	1,160	518
18	1,220	1,100	3,490	5,100	1,220	918	636	294	158	204	1,220	502
19	1,220	1,040	2,920	3,920	1,160	860	708	260	165	235	975	635
20	1,160	975	2,740	3,290	1,040	805	666	270	158	260	805	470
21	1,100	1,040	2,570	2,740	1,040	805	588	462	240	588	805	470
22	1,040	1,040	2,570	2,570	918	805	805	418	918	860	750	455
23	1,040	1,040	2,400	2,400	1,560	750	550	311	975	526	687	455
24	1,220	975	1,920	2,240	27,200	975	478	317	418	455	626	1,220
25	1,770	918	1,840	2,080	8,010	1,560	448	260	282	1,770	560	1,490
26	2,240	860	1,770	2,000	3,290	2,920	486	240	230	2,400	510	6,190
27	1,700	918	3,290	1,920	2,400	2,570	455	220	191	1,620	588	3,920
28	4,370	1,040	5,360	1,920	5,630	2,740	418	191	183	1,100	588	2,570
29	2,740	.....	3,920	1,920	4,610	1,560	382	179	179	805	750	1,620
30	2,080	.....	2,920	1,700	3,390	1,220	388	179	158	666	860	1,490
31	1,840	.....	2,570	.....	4,140	.....	402	165	.....	470	.....	1,330

NOTE.—Discharge determined from a rating curve well defined above 500 second-feet and fairly well defined below.

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Monthly discharge of Rappahannock River near Fredericksburg, Va., for 1913.

[Drainage area, 1,590 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	5,100	1,040	2,050	1.29	1.49	A.
February	2,920	860	1,350	.849	.88	A.
March	17,700	729	3,130	1.97	2.27	A.
April	29,800	1,220	4,440	2.79	3.11	A.
May	27,200	918	2,830	1.78	2.05	A.
June	6,480	750	1,970	1.24	1.38	A.
July	3,700	382	888	.558	.64	A.
August	470	165	310	.195	.22	B.
September	975	110	222	.140	.16	B.
October	2,400	172	553	.348	.40	A.
November	4,850	355	897	.564	.63	A.
December	6,190	425	1,060	.667	.77	A.
The year	29,800	110	1,640	1.03	14.00	

MISCELLANEOUS MEASUREMENTS.

Miscellaneous measurements in North Atlantic Coast basins in 1913.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 3	French River	Quinebaug River	Perryville, Mass.	3.83	100
3	do	do	do	3.73	59
June 28	Connecticut River	Atlantic Ocean	Bellows Falls, Vt.	46.656	3,030
28	do	do	do	46.653	3,020
July 20	do	do	Vernon, Vt.		330 [a]
Oct. 2	Chicopee River	Connecticut River	Red Bridge, Mass.		383 [b]
2	do	do	do		285 [c]
3	do	do	do		227 [d]
3	do	do	do		248 [e]
3	do	do	do		336 [f]
3	do	do	do		408 [g]
4	do	do	do		206 [h]
4	do	do	do		156 [i]
4	do	do	do		74 [j]
5	do	do	do		28 [k]
Mar. 11	West Branch of Delaware River.	Delaware River	Former station at Hancock, N. Y.	4.86	1,760
May 12	do	do	do	3.10	268
Mar. 10	East Branch of Delaware River.	do	do	4.20	1,930
May 12	do	do	do	3.55	823
July 16	Goose Creek	Potomac River	Former station near Leesburg, Va.	.68	40.5

[a] Measurement made 1,500 feet below Vernon dam. All wheel gates closed at dam.
[b] Discharge through two 36-inch wheels at full gate opening under 49.2 feet head.
[c] Discharge through two 36-inch wheels at 0.605 gate opening under 49.9 feet head.
[d] Discharge through two 36-inch wheels at 0.43 gate opening under 50.3 feet head.
[e] Discharge through two 36-inch wheels at 0.70 gate opening under 50.6 feet head.
[f] Discharge through two 36-inch wheels at 0.85 gate opening under 50.7 feet head.
[g] Discharge through two 36-inch wheels at full gate opening under 50.6 feet head.
[h] Discharge through two 36-inch wheels at 0.58 gate opening under 51.1 feet head.
[i] Discharge through two 36-inch wheels at 0.26 gate opening under 51.3 feet head.
[j] Discharge through two 15-inch wheels at 0.575 gate opening under 51.6 feet head.
[k] Leakage through wheels, headgates open and wheel gates closed.

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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 352

SURFACE WATER SUPPLY OF THE UNITED STATES

1913

PART II. SOUTH ATLANTIC AND EASTERN GULF OF MEXICO BASINS

NATHAN C. GROVER, Chief Hydraulic Engineer

GUY C. STEVENS and WARREN E. HALL, District Engineers

WASHINGTON
GOVERNMENT PRINTING OFFICE
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SURFACE WATER SUPPLY OF THE SOUTH ATLANTIC AND EASTERN GULF OF MEXICO BASINS, 1913.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 12 reports presenting results of measurements of flow made on streams in the United States during 1913.

Six of the reports for 1913 contain data for the year ending September 30, and the other six for the calendar year, as indicated in the table on page 6.

The data presented in these reports were collected by the United States Geological Survey under authority implied in the organic law (20 Stat. L., p. 394), which contains the following paragraph:

Provided, That this officer [the Director] shall have the direction of the geological survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies of water supply for irrigation. Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1914.

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1914, inclusive	150,000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting financially in collecting the data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected and of the second kind on page 15.

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Measurements of stream flow have been made at about 3,000 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, and in the Hawaiian Islands. On July 1, 1913, 1,388 gaging stations were being maintained by the Survey and the cooperating organizations and during the year many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in the regular water-supply papers from time to time.

PUBLICATIONS.

A report for each year has been prepared embodying the stream-flow data collected during that year. An index to the reports containing stream-flow measurements prior to 1904 has been published as Water-Supply Paper 119. Circulars are also available giving complete lists of the gaging stations maintained by the Survey to date. and a list of the reports relating to the water supply of the country,

Prior to 1901 gage heights and discharge measurements were published in water-supply papers or bulletins and estimates of monthly discharge in annual reports; since 1901 both classes of data have been published in water-supply papers, and they are now being published in 12 parts, as shown in the following table:

Papers on surface water supply of the United States, 1913.

Part.	No.	Title.	Year used.
I	351	North Atlantic basins	Calendar year.
II	352	South Atlantic and eastern Gulf of Mexico basins	Do.
III	353	Ohio River basin	Year ending Sept. 30.
IV	354	St. Lawrence River basin	Calendar year.
V	355	Upper Mississippi River and Hudson Bay basins	Year ending Sept. 30.
VI	356	Missouri River basin	Calendar year.
VII	357	Lower Mississippi River basin	Do.
VIII	358	Western Gulf of Mexico basins	Year ending Sept. 30.
IX	359	Colorado River basin	Calendar year.
X	360	Great Basin	Year ending Sept. 30.
XI	361	Pacific basins in California	Do.
XII	362	North Pacific basins	Do.

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A list of reports containing stream-flow data is presented in the following table:

Stream-flow data in reports of the United States Geological Survey.

[A=Annual Report; B=Bulletin; WS=Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
WS 35 to 30	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	do	1906.
WS 241 to 252	do	1907–8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.
WS 321 to 332	do	1912.
WS 351 to 362[a]	do	1913.

[a] In preparation.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1913. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1913, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, and 351, which contain records for the New England streams from 1903 to 1913. Results of miscellaneous measurements are published by drainage basins.

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Numbers of water-supply papers containing results of stream measurements, 1899–1913.

	1899 [a]	1900 [b]	1901	1902	1903	1904	1905	1906	1907–8	1909	1910	1911	1912	1913
North Atlantic	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 203	241	261	281	301	321	351
South Atlantic and eastern Gulf of Mexico	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127	[f] 167, 168	[f] 203, 204	242	262	282	302	322	352
Ohio River basin	36	48, [h] 49	65, 75	83	98	128	169	205	243	263	283	303	323	353
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129	170	206	244	264	284	304	324	354
Hudson Bay and Upper Mississippi River	36	49	[j]65, 66, 75	[j] 83, 85	[j] 98, 99, [k] 100	[j] 128, 130	171	207	245	265	285	305	325	355
Missouri River	[l] 36, 37	49, [m] 50	66, 75	84	99	130, [n] 131	172	208	246	266	286	306	326	356
Lower Mississippi River	37	50	[j]65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131	[j] 169, 173	[j] 205, 209	247	267	287	307	327	357
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288	308	328	358
Colorado River	[o] 37, 38	50	66, 75	85	100	133	175, [p] 177	211	249	269	289	309	329	359
Great Basin	38, [q] 39	51	66, 75	85	100	133, [r] 134	176, [r] 177	212, [r] 213	250, [r] 251	270, [r] 271	290, [r] 291	310	330	360
California	38, [s] 39	51	66, 75	85	100	134	177	213	251	271	291	311	331	361
North Pacific	38	51	66, 75	85	100	135	[t] 177, 178	214	252	272	292	312	[u] 332	[u] 362

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.
[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.
[c] Wissahickon and Schuylkill rivers to James River.
[d] New England rivers only.
[e] Hudson River to Delaware River, inclusive.
[f] Susquehanna River to Yadkin River, inclusive.
[g] James River only.
[h] Scioto River.
[i] Lake Ontario and tributaries to St. Lawrence River proper
[j] Tributaries of Mississippi from east.
[k] Hudson Bay only.
[l] Gallatin River.
[m] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[n] Platte and Kansas rivers.
[o] Green and Gunnison rivers and Grand River above junction with Gunnison.
[p] Below junction with Gila.
[q] Mohave River only.
[r] Great Basin in California, excepting Truckee and Carson drainage basins.
[s] Kings and Kern rivers only.
[t] Rogue, Umpqua, and Siletz rivers only.
[u] In three parts: *A*, Pacific drainage in Washington and upper Columbia River basin; *B*, Snake River basin; *C*, Lower Columbia River and Rogue, Umpqua, and Siletz River basins.

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Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C. The edition printed for free distribution is, however, small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will on application furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
Madison, Wis., Capitol Building.
St. Paul, Minn., Old Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 302 Chamber of Commerce Building.
Phoenix, Ariz., Fleming Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Tacoma, Wash., Federal Building.
Portland, Oreg., 416 Couch Building.
San Francisco, Cal., 505 Customhouse.
Los Angeles, Cal., Federal Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications will be sent on application to the Director of the United States Geological Survey, Washington, D. C.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) Those which represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile; and (2) those which represent the actual quantity of water, as run-off in depth in inches, acre-feet, and millions of cubic-feet. The units used in this series of reports are second-foot, second-feet per square mile, run-off in inches, acre-foot, and millions of cubic-feet. They may be defined as follows:

"Second-foot" is an abbreviation for "cubic foot per second" and is a unit of rate of discharge of water flowing in a stream. A second foot is the rate of discharge of water flowing in a channel of rectangular cross-section, 1 foot wide and 1 foot deep, at an average velocity of 1 foot per second. It is generally used as a fundamental

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unit from which others are computed by the use of the factors given in the tables of convenient equivalents (p. 11).

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off, depth in inches," is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot" is equivalent to 43,560 cubic feet, and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation work.

"Millions of cubic-feet" is a unit used to express quantities of water stored in reservoirs and is most frequently used in studies of flood control.

The following terms used in these reports are not in very common use and may be defined as follows:

"Discharge relation" is an abbreviation for the term "relation of gage height to discharge."

"Control," "control section," and "point of control" are terms used to designate that section or sections of the stream below the gage which determines the discharge relation at the gage. It should be noted that the control section may not be the same at all stages.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—to which the surface of the river would fall if there were no flow.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	0.03719	1.041	1.079	1.116	1.153
2	.07438	2.083	2.157	2.231	2.306
3	.11157	3.124	3.236	3.347	3.459
4	.14876	4.165	4.314	4.463	4.612
5	.18595	5.207	5.393	5.578	5.764
6	.22314	6.248	6.471	6.694	6.917
7	.26033	7.289	7.550	7.810	8.070
8	.29752	8.331	8.628	8.926	9.223
9	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the values for one day by the number of days.

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Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1.983	55.54	57.52	59.50	61.49
2	3.967	111.1	115.0	119.0	123.0
3	5.950	166.6	172.6	178.5	184.5
4	7.934	222.1	230.1	238.0	246.0
5	9.917	277.7	287.6	297.5	307.4
6	11.90	333.2	345.1	357.0	368.9
7	13.88	388.8	402.6	416.5	430.4
8	15.87	444.3	460.2	476.0	491.9
9	17.85	499.8	517.7	535.5	553.4

NOTE.—For part of a month multiply values for one day by the number of days.

1 second-foot equals 40 California miner's inches (law of Mar. 23, 1901).
1 second-foot equals 38.4 Colorado miner's inches.
1 second-foot equals 40 Arizona miner's inches.
1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.
1 second-foot for one year (365 days) covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year (365 days) equals 31,536,000 cubic feet.
1 second-foot for one year (365 days) equals 724 acre-feet.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one day equals 86,400 cubic feet.
1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.
1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.
100 California miner's inches equals 18.7 United States gallons per second.
100 California miner's inches for one day equals 4.96 acre-feet.
100 Colorado miner's inches equals 2.60 second-feet.
100 Colorado miner's inches equals 19.5 United States gallons per second.
100 Colorado miner's inches for one day equals 5.17 acre-feet.
100 United States gallons per minute equals 0.223 second-foot.
100 United States gallons per minute for one day equals 0.442 acre-foot.
1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.

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1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1⅓ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

For each regular gaging station the following data (so far as available) are given: Description of the station, list of discharge measurements, table of daily gage height, table of daily discharge, table of monthly and yearly discharge and run-off. For stations at weirs or dams the gage-height table is usually omitted.

In addition to statements regarding the location and equipment of stations, the descriptions give information in regard to any condition which may affect the constancy of the relation of gage height to discharge (the discharge relation, p. 10), covering such points as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the gage. Statements are also made regarding the accuracy of the data.

The table of daily gage height shows the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening, though at many stations only one reading is made each day. At a comparatively few stations automatic gages are used, some of which give a continuous record of river stage in the form of a hydrograph, and others a record printed at regular intervals from which the mean daily gage height can be computed. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. When the discharge relation is affected by ice or by backwater from obstructions, all gage heights are published as recorded, with suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general the zero is located somewhat below the lowest known flow, so that negative readings shall not occur.

In the tables of daily gage height the use of zeros in the hundredths place indicates the limits of accuracy to which the gage was read and to which the mean daily gage height was computed. If a gage is read to tenths or half-tenths once a day or to tenths twice a day no zeros appear in the hundredths place for any stage. If the gage is read to half-tenths twice a day or to quarter-tenths or hundredths,

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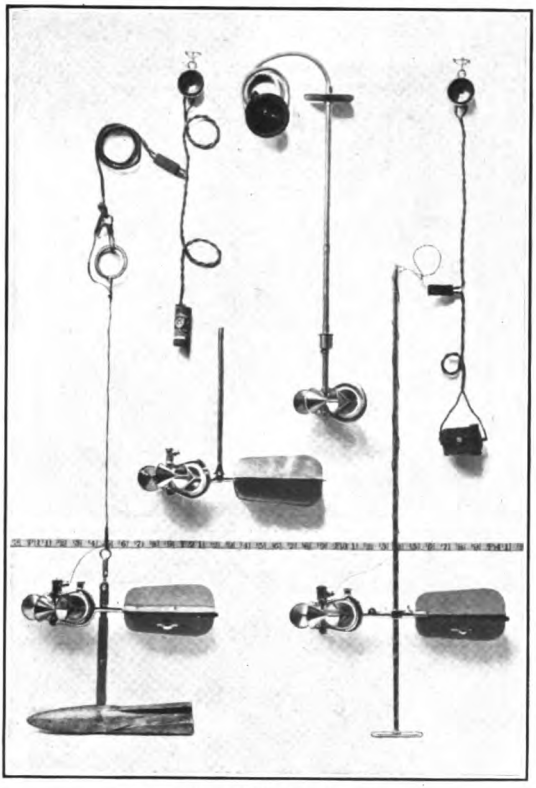
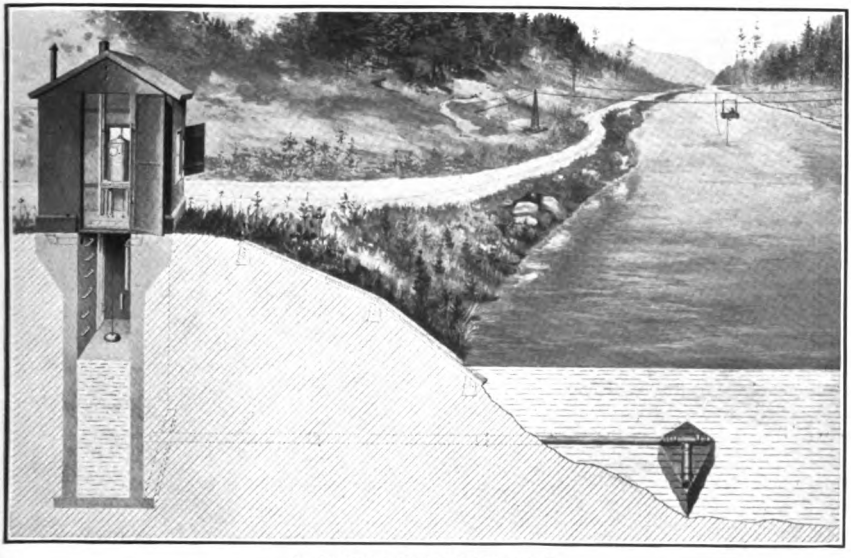


A. PRICE CURRENT METERS.



B. TYPICAL GAGING STATIONS.

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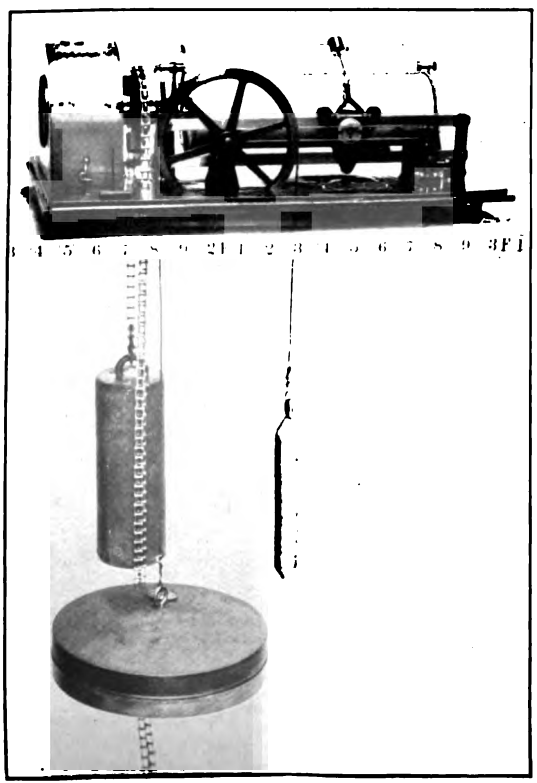
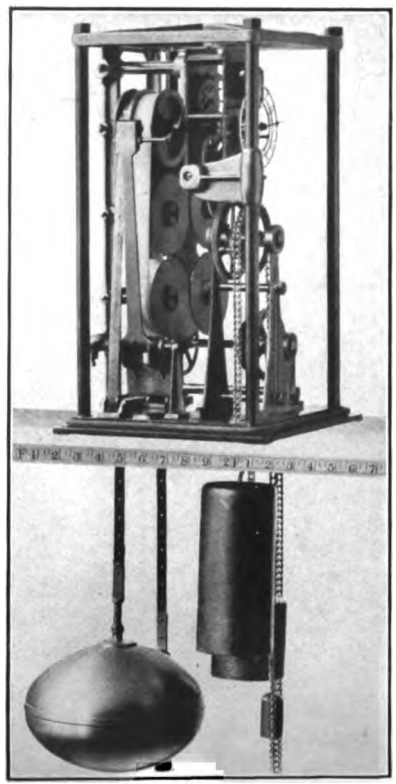
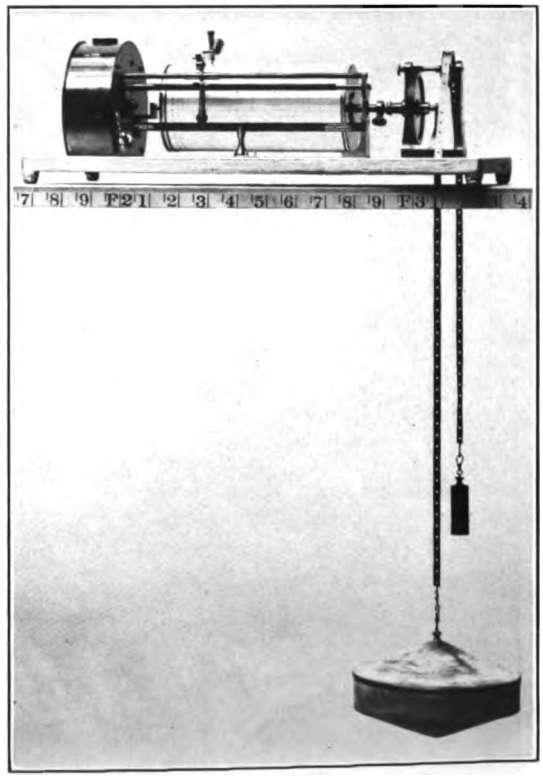


A. STEVENS.



B. GURLEY.



C. FRIEZ.

AUTOMATIC GAGES.

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regardless of the number of readings a day, the gage heights are published to hundredths, and zeros appear in the hundredths place, below a certain limiting stage. This limiting stage is so selected that the average error in the mean daily discharge, resulting from not using the mean daily gage height to hundredths above that stage, shall not be greater than 2 per cent. For automatic gages the allowable average error of the daily discharge has been taken as 1 per cent. The selection of the percentage is arbitrary, but it should be noted that the maximum error will in all cases be twice the average error. In like manner half-tenths are used from the hundredths limit to another higher limit, above which only tenths are used. It is the aim to have the gage height observations at each gaging station recorded to the degree of refinement required by the above method of use, but in practice it is found necessary, in order to avoid confusion in the gage observer's record, to have the observations for all stages recorded to the degree of refinement required for low stages, which usually necessitates readings to hundredths of a foot.

The discharge measurements and gage heights are the base data from which rating tables, daily discharge tables, and monthly discharge tables are computed. The base data for the tables presented in this report, unless otherwise stated in description of station, have been collected by the methods commonly used at current-meter gaging stations and described in standard textbooks.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report but can be determined from the tables of daily gage height and daily discharge.

The table of daily discharge prepared from the rating table and gage-height table gives the discharge in second-feet corresponding to the mean of the gage readings observed each day.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height, and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column of "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on pages 9 and 10, are based.

Plates I and II show typical gaging stations and current meters and gages used in the work.

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ACCURACY OF FIELD DATA AND COMPUTED RESULTS.

The accuracy of stream-flow data depends (1) on the permanence of channel and of the relation between discharge and stage and (2) on the accuracy of observation of stage, measurements of discharge, and interpretation of data.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables stating the probable accuracy of the rating curves used, and an accuracy column is inserted in the monthly discharge table. For the rating curves "well-defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating curve, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and knowledge of local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy, the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use. For this reason the computations of "second-feet per square mile" and "run-off, depth in inches" have not been made for stations draining areas having an annual rainfall of less than 20 inches, nor for those stations draining areas of over 20 inches of rainfall for which it is believed that the computations would be uncertain and misleading because of the presence of large noncontributing districts in the measured drainage area, of omitting estimates of water diverted for irrigation or other use, or of artificial control or unusual natural control of the flow of the river above the gaging station. All values of "second-feet per square mile" and "run-off, depth in inches" previously published by the Survey should be used with extreme caution, and such values in this report should be used with care because of possible inherent sources of error not known to the Survey.

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In general the base data collected each year by the Survey engineers are published, not only to comply with the law but also to afford any engineer the means of analyzing in detail the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published.

COOPERATION.

Special acknowledgments are due for financial assistance rendered by the following corporations and individuals: Alabama Geological Survey; Virginia Railway & Power Co.; Southern Aluminum Co.; Central Georgia Power Co.; Columbus Power Co.; North Carolina Electric & Power Co.; North Georgia Electric Co.; Northern Contracting Co.; Mr. P. F. Whittier; and Mr. B. H. Hardaway.

DIVISION OF WORK.

The field data in the James and Roanoke drainage basins were collected under the direction of G. C. Stevens. The field data for all drainage basins south of Roanoke River were collected under the direction of Warren E. Hall, assisted by B. M. Hall, jr. The ratings, special estimates, and studies of the completed data were made by Warren E. Hall and J. G. Mathers. The computations were made by J. G. Mathers, H. D. Padgett, M. I. Walters, J. H. Morgan, and W. A. Ellwood, and the data were prepared for publication by J. G. Mathers. The report was edited by Mrs. B. D. Wood.

GAGING STATION RECORDS.

JAMES RIVER BASIN.

JAMES RIVER AT BUCHANAN, VA.

Location.—At highway bridge near Chesapeake & Ohio Railway depot at Buchanan, Va.

Records available.—August 18, 1895, to December 31, 1913.

Drainage area.—2,060 square miles.

Gage.—Chain gage attached to the highway bridge; installed November 21, 1903, to replace original wire gage read from August 18, 1895, to that date. Datum of gage was lowered 2 feet April 3, 1897, to avoid negative readings; datum has since remained constant. A span of the bridge and the gage were destroyed by flood on the night of March 27, 1913. A temporary gage was used from April 22 to September 15, 1913, when a new chain gage was installed.

Channel and control.—Bed of river under bridge composed of rock overlain with a thick deposit of mud. A rock control several hundred feet below station.

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Discharge measurements.—Made from downstream side of two-span highway bridge.

Winter flow.—Occasionally affected by ice for short periods.

Accuracy.—Rating curve well developed. Published data considered good.

Cooperation.—Since July 15, 1906, gage-height records have been furnished by the United States Weather Bureau.

Daily gage height, in feet, of James River, at Buchanan, Va., for 1913.

[D. D. Booze, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.6	3.9	6.5	.....	3.7	5.1	3.0	3.0	2.7	2.2	2.9	4.2
2	4.8	3.9	5.7	.....	3.6	4.9	3.0	3.0	2.6	2.2	2.9	4.1
3	4.1	3.9	4.2	.....	3.5	4.7	3.0	3.0	2.5	2.2	2.9	4.7
4	4.2	4.2	3.9	.....	3.4	5.7	6.0	3.0	2.7	2.2	2.8	4.5
5	4.4	5.2	3.7	.....	3.3	4.9	4.6	3.0	2.6	2.2	2.8	4.3
6	4.1	4.8	3.5	.....	3.3	4.4	4.1	3.0	2.5	2.2	2.8	4.2
7	3.9	4.3	3.4	.....	3.2	4.2	3.8	3.0	2.5	2.2	2.7	4.2
8	5.5	3.9	3.3	.....	3.4	4.7	3.8	2.9	2.5	2.2	2.7	4.2
9	5.2	3.5	3.2	.....	3.6	4.5	3.8	2.9	2.4	2.2	5.2	4.1
10	4.9	3.5	3.1	.....	3.6	4.4	5.6	2.9	2.4	2.5	7.8	3.9
11	4.4	3.3	4.0	.....	3.4	4.2	4.6	2.9	2.4	2.8	4.8	3.7
12	4.1	3.3	4.8	.....	3.3	4.0	4.1	3.7	2.4	2.8	4.8	3.5
13	3.9	3.2	4.4	.....	3.2	3.7	3.7	3.8	2.4	2.8	4.7	3.4
14	3.7	3.0	9.1	.....	3.2	3.4	3.6	3.7	2.4	2.8	4.7	3.3
15	3.5	2.8	12.0	.....	3.2	3.2	3.5	3.6	2.4	2.7	4.6	3.2
16	3.4	2.8	10.5	.....	3.1	3.1	3.4	3.5	2.1	2.6	4.7	3.2
17	3.3	2.8	7.6	.....	3.4	3.0	3.4	3.5	2.1	2.6	5.7	3.1
18	3.3	2.8	6.5	.....	3.5	3.0	3.3	3.5	2.1	2.6	5.6	3.1
19	3.2	2.7	5.6	.....	3.5	3.0	3.3	3.4	2.1	2.6	5.0	3.0
20	3.1	2.7	4.8	.....	3.5	3.0	3.3	3.4	2.1	2.9	4.5	3.0
21	3.0	2.7	4.5	.....	3.5	3.0	3.6	3.4	2.9	3.4	4.1	3.0
22	2.9	2.7	4.3	4.6	3.7	3.0	3.5	3.3	2.7	3.9	3.8	2.9
23	2.9	2.6	4.1	4.4	4.2	3.2	3.4	3.3	2.7	3.7	3.6	2.9
24	2.9	2.6	3.9	4.2	8.0	3.0	3.3	3.2	2.6	3.5	3.4	3.6
25	2.9	2.6	3.8	4.1	7.2	3.0	3.3	3.2	2.5	3.8	3.3	3.2
26	2.8	2.7	3.8	4.0	5.7	3.2	3.2	3.1	2.4	5.3	3.2	3.7
27	2.8	3.3	11.3	3.9	5.1	3.5	3.1	3.1	2.4	4.5	3.2	6.2
28	5.5	7.0	.....	3.9	7.7	3.8	3.0	3.0	2.3	4.1	3.2	5.2
29	5.0	.....	.....	3.9	7.2	3.2	3.0	3.0	2.3	3.7	3.2	4.9
30	4.5	.....	.....	3.8	6.1	3.0	3.0	2.9	2.3	3.4	3.2	4.6
31	4.1	.....	.....	.....	5.5	.....	3.0	2.9	.....	3.1	.....	4.4

NOTE.—Span of bridge and gage destroyed by flood on night of March 27. Crest of flood determined by levels on October 2, 1914, to have been 31.0 feet. New gage installed on April 22.

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Daily discharge, in second-feet, of James River, at Buchanan, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,480	2,820	8,760	.....	2,460	5,330	1,400	1,400	1,040	515	1,280	1,670
2	4,660	2,820	6,720	.....	2,220	4,880	1,400	1,400	930	515	1,280	1,820
3	3,210	2,820	3,410	.....	2,120	4,450	1,400	1,400	820	515	1,280	4,450
4	3,410	3,410	2,820	.....	1,960	6,720	7,460	1,400	1,040	515	1,160	4,020
5	3,820	5,560	2,460	.....	1,820	4,880	4,240	1,400	930	515	1,160	3,610
6	3,210	4,660	2,120	.....	1,820	3,820	3,210	1,400	820	515	1,160	3,410
7	2,820	3,610	1,930	.....	1,670	3,410	2,640	1,400	820	515	1,040	3,410
8	6,250	2,820	1,820	.....	1,930	4,450	2,640	1,280	820	515	1,040	3,410
9	5,560	2,120	1,670	.....	2,290	4,020	2,640	1,280	715	515	5,560	3,210
10	4,880	2,120	1,530	.....	2,220	3,820	6,480	1,280	715	820	12,500	2,820
11	3,820	1,820	3,020	.....	1,960	3,410	4,240	1,280	715	1,160	4,660	2,460
12	3,210	1,820	4,660	.....	1,820	3,020	3,210	2,460	715	1,160	4,660	2,120
13	2,820	1,670	3,820	.....	1,670	2,460	2,460	2,640	715	1,160	4,450	1,930
14	2,460	1,400	15,800	.....	1,670	1,960	2,290	2,460	715	1,160	4,450	1,820
15	2,120	1,160	28,800	.....	1,670	1,670	2,120	2,290	715	1,040	4,240	1,670
16	1,960	1,160	22,300	.....	1,530	1,530	1,960	2,120	430	930	4,450	1,670
17	1,820	1,160	11,900	.....	1,960	1,400	1,960	2,120	430	930	6,720	1,530
18	1,820	1,160	8,760	.....	2,120	1,400	1,820	2,120	430	930	6,480	1,530
19	1,670	1,040	6,480	.....	2,120	1,400	1,820	1,960	430	930	5,100	1,400
20	1,530	1,040	4,660	.....	2,120	1,400	1,820	1,960	430	1,280	4,020	1,400
21	1,400	1,040	4,020	.....	2,120	1,400	2,290	1,960	1,280	1,960	3,210	1,400
22	1,280	1,040	3,610	4,240	2,460	1,400	2,120	1,820	1,040	2,820	2,640	1,280
23	1,280	930	3,210	3,820	3,410	1,670	1,960	1,820	1,040	2,460	2,290	1,280
24	1,280	930	2,820	3,410	13,100	1,400	1,820	1,670	930	2,120	1,960	1,400
25	1,280	930	2,640	3,210	10,700	1,400	1,820	1,670	820	2,640	1,820	1,670
26	1,160	1,040	2,640	3,020	6,720	1,670	1,670	1,530	715	5,780	1,670	2,460
27	1,160	1,820	.....	2,820	5,330	2,120	1,530	1,530	715	4,020	1,670	8,230
28	6,250	10,100	.....	2,820	12,200	2,640	1,400	1,400	610	3,210	1,670	5,560
29	5,100	.....	.....	2,820	10,700	1,670	1,400	1,400	610	2,460	1,670	4,880
30	4,020	.....	.....	2,640	7,720	1,400	1,400	1,280	610	1,960	1,670	4,240
31	3,210	.....	.....	.....	6,250	.....	1,400	1,280	.....	1,530	.....	3,820

NOTE.—Discharge completed from a rating curve fairly well defined below 20,000 second-feet.

Monthly discharge of James River at Buchanan, Va., for 1913.

[Drainage area, 2,060 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	6,480	1,160	3,060	1.49	1.72	B.
February	10,100	930	2,290	1.11	1.16	B.
March 1-26	.....	1,530	6,280	3.05	2.95	B.
April 22-30	.....	2,640	3,200	1.55	.52	B.
May	13,100	1,530	3,870	1.88	2.17	B.
June	6,720	1,400	2,740	1.33	1.48	B.
July	7,460	1,400	2,450	1.19	1.37	B.
August	2,640	1,280	1,690	.820	.94	B.
September	1,280	430	758	.368	.41	B.
October	5,780	515	1,520	.738	.85	B.
November	12,500	1,040	3,230	1.57	1.75	B.
December	8,230	1,280	2,760	1.34	1.54	B.

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JAMES RIVER AT HOLCOMB ROCK, VA.

Location.—At works of the Virginia Electrolytic Co., at Holcomb Rock, Va.
Records available.—Gage heights January 1, 1900, to December 31, 1913.
Drainage area.—Not measured.
Gage.—A copper float inclosed in a stilling box, with a vertical rod extending up through power-house floor.
Discharge measurements.—None made at this station.
Cooperation.—Gage heights furnished by the Virginia Electrolytic Co.

Daily gage height, in feet, of James River at Holcomb Rock, Va., for 1913.

[R. D. Damson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.95	2.9	3.5	3.55	1.4	3.0	1.15	0.95	0.5	−0.15	0.7	1.2
2	3.8	2.8	2.45	3.15	1.15	2.6	1.1	1.5	.1	.1	.6	2.25
3	3.45	3.0	2.05	2.6	1.05	2.45	1.1	1.2	.15	— .25	.6	2.1
4	3.7	3.1	1.6	2.25	1.3	2.4	4.9	1.2	.25	.0	.35	2.45
5	3.8	4.4	1.35	2.2	1.25	2.4	2.25	1.0	.2	.2	.35	2.0
6	3.2	3.8	1.25	1.95	1.3	2.05	1.7	1.05	.15	— .2	.35	1.45
7	2.8	3.35	1.15	1.75	1.25	1.85	1.5	1.25	— .25	.05	.25	1.5
8	3.6	2.85	.9	1.55	1.35	2.25	1.25	1.25	.05	— .35	.3	1.65
9	4.3	2.4	.65	1.5	1.4	2.15	1.1	1.2	— .05	— .4	5.7	1.85
10	4.05	2.45	.85	1.3	1.4	1.9	1.0	.6	— .3	.25	8.05	1.7
11	3.4	2.35	1.2	1.35	1.1	1.55	1.5	.9	— .2	.35	4.3	1.5
12	2.85	.95	2.35	5.85	1.2	1.5	2.1	1.4	— .1	.4	3.0	1.35
13	2.75	.9	2.05	8.2	1.2	1.4	1.3	1.65	— .2	.6	2.3	1.25
14	2.5	.8	9.45	8.9	1.2	1.4	1.1	2.15	— .5	.6	2.05	1.05
15	2.5	.65	12.3	8.55	1.2	1.2	1.1	1.45	— .35	.4	2.65	1.05
16	2.5	.5	11.4	9.3	1.2	1.2	.85	1.3	— .35	.45	2.65	1.0
17	2.25	.7	7.35	6.9	1.3	1.15	.35	1.0	— .1	.15	2.2	.9
18	2.1	.6	4.9	4.95	1.2	1.2	.65	1.05	— .1	.15	3.35	.9
19	2.0	.6	3.55	3.9	1.2	1.05	.95	.9	.0	.1	2.7	.85
20	2.05	.5	2.95	3.25	1.2	1.2	1.9	1.25	— .3	.8	2.25	.8
21	2.0	.6	2.5	2.75	1.2	1.55	1.85	1.3	.75	1.1	1.85	.65
22	1.85	.6	2.15	2.35	1.6	.85	1.2	1.1	.6	1.55	1.5	.7
23	1.8	.35	1.85	2.2	4.8	1.35	1.25	1.0	.45	1.35	1.25	.6
24	1.75	.65	1.6	2.1	9.3	1.2	1.25	.8	.45	1.15	1.25	.75
25	1.8	.55	1.4	1.8	6.7	1.2	1.05	1.0	.25	1.95	1.0	.8
26	1.7	.55	1.65	1.7	4.35	1.1	1.3	1.0	.2	2.65	1.0	1.35
27	2.15	.75	7.75	1.7	.....	1.65	.65	.95	.1	2.35	.95	4.9
28	3.9	3.05	25.8	1.65	6.1	1.4	1.15	.8	.1	1.85	.9	3.35
29	4.4	.....	8.05	1.6	6.45	1.3	1.1	.8	— .05	1.45	.85	2.65
30	3.55	.....	5.7	1.55	4.45	1.2	1.05	.65	— .15	1.25	.9	2.15
31	3.05	.....	4.2	.....	3.45	.....	.9	.55	.....	.9	.....	1.85

JAMES RIVER AT CARTERSVILLE, VA.

Location.—At highway bridge crossing James River between Pemberton and Cartersville, about 50 miles above Richmond.
Records available.—January 1, 1899, to December 31, 1913.
Drainage area.—6,230 square miles.
Gage.—Standard chain gage attached to the highway bridge July 24, 1903, to replace wire gage which had been used from January 1, 1899, to that date.
Channel.—Left bank overflows for several hundred feet at a stage of about 20 feet; right bank does not overflow.
Discharge measurements.—Made from downstream side of six-span highway bridge.
Winter flow.—Occasionally affected by ice for short periods during severe winters.
Accuracy.—Rating curve well developed for ordinary stages. Above the overflow point the discharge is uncertain. No measurement made in 1913, but one made in 1914 indicated that the discharge relation has remained constant.

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Daily gage height, in feet, of James River at Cartersville, Va., for 1913.

[B. W. Palmore, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.7	4.1	4.4	8.1	3.2	12.2	2.7	1.6	1.2	1.3	2.6	2.3
2	7.2	3.8	4.8	6.1	2.9	6.0	2.4	1.45	1.1	1.7	2.5	2.7
3	5.6	3.4	4.6	5.2	2.8	5.1	2.3	1.5	1.1	1.25	2.1	3.5
4	5.3	3.9	4.1	4.7	2.7	5.6	2.2	2.0	1.4	1.15	2.0	3.9
5	4.9	3.8	3.4	4.2	2.6	5.2	3.4	1.8	1.3	1.1	1.9	4.3
6	4.8	3.2	3.1	4.0	2.5	5.1	4.4	1.6	1.25	1.05	1.8	3.9
7	4.3	3.1	2.9	3.7	2.4	4.4	3.4	2.1	1.15	1.05	1.7	3.7
8	3.7	3.0	2.7	3.5	2.4	7.4	2.4	1.3	1.1	1.0	1.7	3.2
9	3.5	3.0	2.6	3.2	2.4	4.8	2.2	1.25	1.0	1.15	3.0	3.1
10	4.8	2.9	2.4	3.1	2.3	4.1	2.0	1.6	.88	1.3	13.5	3.1
11	4.5	3.9	3.1	2.9	2.3	3.4	3.5	2.3	.95	2.0	10.2	3.0
12	4.1	2.8	3.6	5 3	2.2	3.2	2.1	2.2	.91	1.7	7.2	2.9
13	3.7	2.6	4.8	18.0	2.1	3.0	2.3	1.5	.90	1.5	6.3	2.8
14	3.5	2.4	12.5	16.0	2.1	2.8	2.8	2.7	.92	1.6	4.2	2.7
15	3.0	2.3	19.7	13.6	2.0	2.7	2.2	2.8	.94	1.6	3.8	2.5
16	2.9	2.2	18.9	13.0	2.0	2.5	2.2	2.7	.88	1.55	3.2	2.4
17	2.7	2.1	14.4	12.4	2.2	2.2	2.0	2.2	.78	1.4	5.1	2.4
18	2.7	1.9	10.1	9.7	2.6	2.0	1.8	1.9	.92	1.35	5.2	2.3
19	2.6	1.9	7.8	8.2	2.5	1.9	1.9	1.8	1.0	1.3	5.0	2.2
20	2.4	2.0	6.5	7.3	2.1	1.9	1.8	5.1	1.05	1.7	4.6	2.1
21	2.3	2.0	5.8	6.2	2.1	1.8	.....	3.3	1.1	2.5	4.0	2.0
22	2.2	2.0	5.5	5.3	2.2	1.8	.....	3.0	3.1	2.4	3.9	2.0
23	2.2	1.9	5.1	4.9	2.9	2.4	.....	2.3	3.0	2.3	3.7	2.0
24	2.2	1.9	4.3	4.4	16.3	4.0	2.3	2.5	2.5	2.9	3.0	2.9
25	2.4	1.8	4.0	4.1	15.8	4.3	2.3	3.1	1.7	5.2	2.8	3.3
26	2.3	1.9	3.8	3.9	12.0	4.0	1.9	2.0	1.6	5.8	2.5	6.1
27	2.4	2.0	4.0	3.7	9.8	3.2	1.8	1.9	1.4	4.9	2.4	6.0
28	4.8	2.9	10.9	3.6	10.2	3.1	1.5	1.8	1.25	4.8	2.4	5.9
29	4.9	.....	21.6	3.4	8.5	4.1	1.4	1.6	1.15	4.6	2.5	5.5
30	5.6	.....	13.0	3.3	8.8	3.8	1.6	1.4	1.1	3.6	2.4	4.6
31	4.7	.....	9.1	.....	11.0	.....	1.3	1.3	.....	2.9	.....	4.1

Daily discharge, in second-feet, of James River at Cartersville, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	12,200	8,060	8,780	19,300	5,970	33,700	4,880	2,640	1,910	2,090	4,670	4,040
2	16,500	7,340	9,780	13,300	5,310	13,000	4,250	2,360	1,740	2,830	4,460	4,880
3	11,900	6,420	9,280	10,800	5,090	10,600	4,040	2,450	1,740	2,000	3,630	6,650
4	11,100	7,580	8,060	9,530	4,880	11,900	3,830	3,430	2,270	1,820	3,430	7,580
5	10,000	7,340	6,420	8,300	4,670	10,800	6,420	3,030	2,090	1,740	3,230	8,540
6	9,780	5,970	5,750	7,820	4,460	10,600	8,780	2.640	2,000	1,660	3,030	7,580
7	8,540	5,750	5,310	7,110	4,250	8,780	6,420	3,630	1,820	1,660	2,830	7,110
8	7,110	5,530	4,880	6,650	4,250	17,100	4,250	2,090	1,740	1,570	2,830	5,970
9	6,650	5,530	4,670	5,970	4,250	9,780	3,830	2,000	1,570	1,820	5,530	5,750
10	9,780	5,310	4,250	5,750	4,040	8,060	3,430	2,640	1,380	2,090	38,600	5,750
11	9,030	7,580	5,750	5,310	4,040	6,420	6,650	4,040	1,490	3,430	26,400	5,530
12	8,060	5,090	6,880	11,100	3,830	5,970	3,630	3,830	1,430	2,830	16,500	5,310
13	7,110	4,670	9,780	57,200	3,630	5,530	4,040	2,450	1,410	2,450	13,800	5,090
14	6,650	4,250	34,800	48,600	3,630	5,090	5,090	4,880	1,440	2,640	8,300	4,880
15	5,530	4,040	64,900	39,000	3,430	4,880	3,830	5,090	1,470	2,640	7,340	4,460
16	5,310	3,830	61,200	36,700	3,430	4,460	3,830	4,880	1,380	2,540	5,970	4,250
17	4,880	3,630	42,100	34,400	3,830	3,830	3,430	3,830	1,220	2,270	10,600	4,250
18	4,880	3,230	26,100	24,700	4,670	3,430	3,030	3,230	1,440	2,180	10,800	4,040
19	4,670	3,230	18,300	19,600	4,460	3,230	3.230	3,030	1,570	2,090	10,300	3,830
20	4,250	3,430	14,400	16,800	3,630	3,230	3,030	10,600	1,660	2,830	9,280	3,630
21	4,040	3,430	12,400	13,500	3,630	3,030	3,280	6,190	1,740	4,460	7,820	3,430
22	3,830	3,430	11,600	11,100	3,830	3,030	3,530	5,530	5,750	4,250	7,580	3,430
23	3,830	3,230	10,600	10,000	5,310	4,250	3,780	4,040	5,530	4,040	7,110	3,430
24	3,830	3,230	8,540	8,780	49,800	7,820	4,040	4,460	4,460	5,310	5,530	5,310
25	4,250	3,030	7,820	8,060	47,800	8,540	4,040	5,750	2,830	10,800	5,090	6,190
26	4,040	3,230	7,340	7,580	32,900	7,820	3,230	3,430	2,640	12,400	4,460	13,300
27	4,250	3,430	7,820	7,110	25,000	5,970	3,030	3,230	2,270	10,000	4,250	13,000
28	9,780	5,310	28,900	6,880	26,400	5,750	2,450	3,030	2,000	9,780	4,250	12,700
29	10,000	.....	74,600	6,420	20,600	8,060	2,270	2,640	1,820	9,280	4,460	11,600
30	11,900	.....	36,700	6,190	21,600	7,340	2,640	2,270	1,740	9,280	4,250	9,280
31	9,530	.....	22,600	.....	29,300	.....	2,090	2,090	.....	5,310	.....	8,060

NOTE.—Daily discharge determined from a rating curve well defined below 10,000 second-feet and fairly well defined between 10,000 and 40,000 second-feet. Discharge interpolated July 21–23.

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Monthly discharge of James River at Cartersville, Va., for 1913.

[Drainage area, 6,230 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	16,500	3,830	7,520	1.21	1.40	A.
February	8,060	3,030	4,860	.780	.81	A.
March	74,600	4,250	18,700	3.00	3.46	B.
April	57,200	5,310	15,800	2.54	2.83	B.
May	49,800	3,430	11,400	1.83	2.11	B.
June	33,700	3,030	8,070	1.30	1.45	A.
July	8,780	2,090	4,010	.644	.74	A.
August	10,600	2,000	3,720	.597	.69	A.
September	5,750	1,220	2,120	.340	.38	A.
October	12,400	1,570	4,200	.674	.78	A.
November	38,600	2,830	8,210	1.32	1.47	A.
December	13,300	3,430	6,410	1.03	1.19	A.
The year	74,600	1,220	7,930	1.27	17.21	

ROANOKE RIVER BASIN.

ROANOKE RIVER AT ROANOKE, VA.

Location.—At Walnut Street highway bridge at Roanoke, Va.

Records available.—July 10, 1896, to July 14, 1906; May 7, 1908, to December 31, 1913.

Drainage area.—388 square miles.

Gage.—Standard chain gage was attached to Walnut Street Bridge November 26, 1903, to replace wire gage that had been read from July 10, 1896, to that date.

Channel and control.—Nearly straight, 160 feet wide between bridge abutments; broken by one pier. The bed of the stream is composed of coarse gravel and small bowlders. Both banks may overflow at extreme flood stages. Control is loose bowlders and shifts slightly.

Discharge measurements.—Made from downstream side of two-span highway bridge.

Winter flow.—Occasionally affected by ice for short periods.

Accuracy.—Owing to varying conditions of flow frequent measurements are required at low stages to adequately define the discharge curve from year to year. No measurements were made in 1913, but measurements in 1914 indicate that the discharge relation has remained constant.

Cooperation.—Gage-height records furnished through the courtesy of the Roanoke Railway & Electric Co., J. W. Hancock, general manager.

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Daily gage height, in feet, of Roanoke River at Roanoke, Va., for 1913.

[C. C. Hogshead and W. J. Lambert, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	1.4	2.1	1.8	1.1	1.6	1.2	0.8	0.7	0.7	0.9	1.0
2	1.4	1.4	1.9	1.7	1.0	1.5	1.1	.75	.65	.7	.9	2.0
3	1.4	1.4	1.7	1.6	1.0	1.4	1.9	.75	.65	.7	.9	1.7
4	1.4	1.4	1.5	1.5	1.0	1.4	2.8	.7	.7	.7	.85	1.5
5	1.5	1.4	1.4	1.5	1.0	1.3	2.5	.7	1.1	.7	.8	1.4
6	1.4	1.3	1.3	1.4	1.0	1.3	1.8	.7	.9	.65	.8	1.3
7	1.3	1.2	1.2	1.3	1.0	1.2	1.5	.75	.7	.7	.8	1.3
8	1.2	1.1	1.2	1.3	1.0	1.6	1.3	.75	.6	.65	.8	1.4
9	1.1	1.1	1.2	1.3	1.0	1.5	1.2	.75	.7	.8	3.0	1.3
10	1.1	1.1	1.2	1.3	1.0	1.3	1.1	1.9	.....	1.2	2.3	1.2
11	1.1	1.1	1.4	1.3	.9	1.2	1.2	1.7	.....	1.2	1.8	1.2
12	1.0	1.1	1.3	1.6	.9	1.3	1.5	.9	.....	1.1	1.5	1.1
13	1.2	1.0	1.3	2.6	.9	1.3	1.2	.9	.....	1.1	1.5	1.1
14	1.1	1.0	7.7	2.1	.9	1.2	1.1	1.0	.....	.9	1.3	1.0
15	1.0	1.0	4.0	1.9	.9	1.1	1.0	.9	.....	.9	1.3	1.0
16	1.0	1.0	3.4	1.9	1.0	1.1	1.0	.9	.....	.8	1.2	1.0
17	1.0	1.0	2.4	1.8	1.2	1.0	1.0	.7	.....	.8	1.2	1.0
18	1.0	.9	2.2	1.7	1.2	1.0	.9	.7	.....	.8	1.2	1.0
19	1.0	.9	1.9	1.6	1.0	1.0	.9	1.1	.....	.85	1.2	1.0
20	.9	.9	1.8	1.6	.9	1.0	.9	1.2	.....	1.3	1.1	.9
21	.9	1.0	1.7	1.5	1.0	.9	.9	1.1	.....	1.7	1.1	.9
22	.9	1.0	1.6	1.4	1.1	1.0	.8	1.0	.....	1.4	1.1	.9
23	.9	1.0	1.5	1.3	3.9	1.7	.8	.9	.....	1.2	1.0	.9
24	.9	1.0	1.5	1.3	5.7	2.2	.8	.9	.9	1.2	1.0	1.0
25	.9	1.0	1.4	1.3	3.0	1.3	.75	.8	.9	1.4	1.0	1.0
26	.9	.9	1.4	1.2	2.4	1.2	.9	.7	.8	1.3	.9	2.3
27	1.0	1.6	3.4	1.2	2.0	1.6	.75	.7	.8	1.2	.9	1.8
28	2.5	2.9	3.5	1.2	2.8	1.4	.75	.7	.8	1.1	.9	1.7
29	1.9	.....	2.4	1.2	2.2	1.8	1.1	.7	.7	1.1	.9	1.4
30	1.6	.....	2.1	1.1	2.0	1.5	.9	.7	.7	1.0	.9	1.4
31	1.5	.....	2.0	.....	1.8	.....	.8	.7	.....	.9	.....	1.3

Daily discharge, in second-feet, of Roanoke River at Roanoke, Va., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	375	326	770	550	206	430	242	115	89	89	143	173
2	326	326	620	490	173	375	206	102	77	89	143	690
3	326	326	490	430	173	326	620	102	77	89	143	490
4	326	326	375	375	173	326	1,440	89	89	89	129	375
5	375	326	326	375	173	282	1,130	89	206	89	115	326
6	326	282	282	326	173	282	550	89	143	77	115	282
7	282	242	242	282	173	242	375	102	89	89	115	282
8	242	206	242	282	173	430	282	102	65	77	115	326
9	206	206	242	282	173	375	242	102	89	115	1,660	282
10	206	206	242	282	173	282	206	620	65	242	940	242
11	206	206	326	282	143	242	242	490	55	242	550	242
12	173	206	282	430	143	282	375	143	50	206	375	206
13	242	173	282	1,230	143	282	242	143	50	206	375	206
14	206	173	7,900	770	143	242	206	173	50	143	282	173
15	173	173	2,900	620	143	206	173	143	65	143	282	173
16	173	173	2,140	620	173	206	173	143	65	115	242	173
17	173	173	1,030	550	242	173	173	89	50	115	242	173
18	173	143	850	490	242	173	143	89	55	115	242	173
19	173	143	620	430	173	173	143	206	90	129	242	173
20	143	143	550	430	143	173	143	242	140	282	206	143
21	143	173	490	375	173	143	143	206	200	490	206	143
22	143	173	430	326	206	173	115	173	300	326	206	143
23	143	173	375	282	2,780	490	115	143	200	242	173	143
24	143	173	375	282	5,200	850	115	143	143	242	173	173
25	143	173	326	282	1,660	282	102	115	143	326	173	173
26	143	143	326	242	1,030	242	143	89	115	282	143	940
27	173	430	2,140	242	690	430	102	89	115	242	143	550
28	1,130	1,540	2,260	242	1,440	326	102	89	115	206	143	490
29	620	.....	1,030	242	850	550	206	89	89	206	143	326
30	430	.....	770	206	690	375	143	89	89	173	143	326
31	375	.....	690	.....	550	.....	115	89	.....	143	.....	282

NOTE.—Daily discharge determined from a rating curve well defined below 2,000 second-feet. Discharge Sept. 10–23, estimated from comparison of hydrographs of stations in James and Roanoke basins.

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Monthly discharge of Roanoke River at Roanoke, Va., for 1913.

[Drainage area, 388 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	1,130	143	271	0.698	0.80	A.
February	1,540	143	266	.686	.71	A.
March	7,900	242	965	2.49	2.87	B.
April	1,230	206	408	1.05	1.17	A.
May	5,200	143	604	1.56	1.80	B.
June	850	143	312	.804	.90	A.
July	1,440	102	281	.724	.83	A.
August	620	89	151	.389	.45	A.
September	a 300	a 50	106	.273	.30	D.
October	490	77	181	.466	.54	A.
November	1,660	115	277	.714	.80	A.
December	940	143	290	.747	.86	A.
The year	7,900	a 50	344	.887	12.03	

a Estimated.

ROANOKE RIVER AT OLD GASTON, N. C.

Location.—At bridge of Roanoke Railway Co., at Old Gaston, N. C., 1¼ miles north of Thelma, N. C., about three-fourths of a mile below mouth of Indian Creek and 2½ miles above mouth of Deep Creek.

Records available.—December 7, 1911, to December 31, 1913.

Drainage area.—8,350 square miles.

Gage.—Standard chain gage attached to outside of guard timber on downstream side of second span from right end of deck-plate girder railroad bridge of Roanoke Railway Co.

Channel and control.—Channel fairly permanent; point of control, about 1 mile below gage, is of rock and probably permanent.

Discharge measurements.—Made from downstream side of bridge to which gage is attached. Measuring section broken by 11 bridge piers.

Floods.—Flood of 1877 highest known in this locality. No definite marks preserved at Old Gaston, but from authentic information regarding the crest height as observed in 1877 the approximate height has been determined as about 19 feet, referred to present gage datum. The corresponding discharge is about 275,000 second-feet.

Winter flow.—Ice sometimes forms to considerable thickness at this station.

Regulation.—Persons engaged in the operation of power plants at Roanoke Rapids and Weldon have observed on Tuesday or Wednesday during periods of low water a trough probably due to the weekly shutdown of large power plants farther upstream.

Accuracy.—The gage being situated about 1 mile from the lower end of a pool approximately 3 miles long, the station is not very sensitive. The left bank overflows in extreme floods; but a fair determination can be made of the overflow discharge around the bridge.

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Daily gage height, in feet, of Roanoke River at Old Gaston, N. C., for 1913.

[R. A. Howell, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	3.6	4.4	5.2	2.35	3.4	3.7	1.55	2.6	1.45	2.15	1.95
2	2.5	3.2	5.5	4.5	2.15	3.0	3.4	1.45	2.9	1.65	1.95	2.25
3	3.0	3.0	4.2	3.8	2.15	2.9	3.5	1.7	3.3	1.5	1.85	4.2
4	2.8	2.6	3.4	3.4	2.1	2.9	2.15	3.2	3.9	1.55	1.85	5.6
5	2.9	3.0	3.2	3.0	2.05	2.8	2.3	3.8	6.5	1.45	1.9	4.2
6	2.8	2.8	2.8	2.8	2.6	2.4	5.1	3.4	6.4	1.35	1.8	3.4
7	2.8	2.8	2.5	2.6	2.1	2.3	4.1	2.6	4.3	1.25	1.7	3.0
8	2.8	2.6	2.45	2.25	1.9	2.45	3.0	1.9	3.4	1.15	1.75	2.9
9	2.5	2.3	2.3	2.6	1.95	3.6	2.5	1.7	2.4	1.5	2.6	2.7
10	2.3	2.25	2.2	2.25	2.1	3.6	2.0	1.85	2.05	1.8	6.7	3.0
11	2.25	2.1	2.1	2.25	2.0	3.0	1.9	2.05	1.75	2.05	8.9	2.4
12	2.15	2.3	2.8	2.2	1.95	2.35	1.8	1.95	1.85	3.3	6.9	2.6
13	2.05	2.15	2.8	3.3	1.9	2.8	3.2	3.2	1.55	2.9	4.1	1.95
14	1.9	2.3	3.0	8.3	2.0	3.2	2.6	3.2	1.55	2.05	3.5	2.3
15	2.2	2.1	9.4	9.1	1.9	2.8	2.2	2.6	1.6	2.5	3.0	2.2
16	2.05	2.1	11.0	5.6	1.85	2.6	2.25	2.05	1.4	2.0	2.8	2.0
17	1.95	2.05	13.0	4.4	1.95	2.1	1.85	2.05	1.3	1.75	2.6	1.95
18	1.95	1.95	12.7	4.2	1.9	2.25	1.8	2.2	1.55	1.7	2.6	2.1
19	1.9	2.0	5.7	3.8	2.5	2.0	1.8	1.85	1.45	1.8	3.0	1.95
20	2.0	1.95	4.3	3.4	2.8	1.95	1.8	1.5	1.55	1.6	2.8	2.05
21	1.95	1.9	3.9	3.2	2.8	1.95	1.8	1.7	2.3	1.7	2.6	1.95
22	2.05	2.0	3.7	2.8	2.05	1.9	2.8	1.65	2.05	4.8	2.35	1.9
23	2.05	2.05	3.6	3.0	2.15	2.2	2.25	1.95	2.4	3.6	2.25	1.9
24	2.05	2.05	3.4	2.8	4.4	3.4	1.9	2.2	3.6	3.4	2.15	2.05
25	2.8	2.0	3.2	2.6	6.8	4.2	1.65	1.95	2.8	3.4	2.0	3.0
26	3.7	2.15	3.0	2.6	8.7	3.1	1.6	1.95	2.2	5.6	1.95	4.3
27	3.5	2.1	3.1	2.4	7.8	3.3	1.65	1.6	1.8	5.3	1.75	4.9
28	5.1	2.35	3.4	2.4	4.2	3.4	1.6	1.85	1.75	4.8	2.0	5.0
29	6.0	.....	4.2	2.4	5.0	3.7	1.5	1.65	1.8	3.2	1.95	4.0
30	5.9	.....	4.8	2.6	5.8	3.5	1.5	1.7	1.6	2.7	1.95	3.4
31	4.4	.....	3.8	.....	4.2	.....	1.55	2.15	.....	2.45	.....	3.3

Daily discharge, in second-feet, of Roanoke River at Old Gaston, N. C., for 1911–1913.

Day.	Dec.	Day.	Dec.	Day.	Dec.
1911.		1911.		1911.	
1	.....	11	3,090	21	9,500
2	.....	12	3,090	22	15,300
3	.....	13	2,460	23	15,300
4	.....	14	3,410	24	32,400
5	.....	15	5,500	25	37,800
6	.....	16	4,430	26	25,900
7	3,740	17	15,300	27	23,600
8	3,410	18	27,400	28	17,900
9	3,090	19	20,600	29	14,200
10	2,770	20	11,900	30	11,400
				31	9,500

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Daily discharge, in second-feet, of Roanoke River at Old Gaston, N. C., for 1911–1913—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1912.												
1	9,060	20,600	22,100	68,700	12,200	5,320	10,700	2,620	1,880	3,580	2,770	2,930
2	11,400	14,200	13,600	22,100	11,200	5,680	10,700	3,410	1,500	3,580	2,460	2,930
3	10,900	9,000	10,700	16,900	9,280	5,320	16,200	2,160	1,250	2,930	2,770	2,930
4	9,960	9,000	9,500	16,200	8,000	5,680	10,700	2,160	1,250	2,930	2,620	2,620
5	9,500	5,500	8,420	13,900	7,010	4,600	8,210	2,020	790	2,620	2,460	3,250
6	8,630	5,500	9,060	11,400	6,620	4,780	4,960	3,410	1,880	2,620	2,160	3,350
7	7,010	5,500	8,840	9,960	5,870	4,960	6,430	2,020	1,880	2,460	2,620	4,490
8	5,500	4,430	11,900	10,200	9,280	4,960	7,400	2,620	2,020	3,090	3,580	4,780
9	5,140	4,430	21,400	10,200	14,400	7,400	5,680	2,930	1,500	1,880	36,000	4,600
10	4,780	5,140	22,800	9,730	12,500	6,620	5,870	2,310	1,500	2,160	23,600	3,910
11	4,780	5,500	20,600	9,500	8,420	4,260	3,910	2,310	2,160	1,500	10,700	4,780
12	4,780	5,140	15,600	8,840	11,200	4,960	4,600	2,310	2,160	2,310	6,620	5,140
13	4,600	3,740	19,200	8,420	29,000	5,500	6,240	2,020	1,750	2,310	6,240	3,250
14	4,400	4,780	31,500	8,210	60,800	3,910	5,500	1,880	1,500	2,020	4,260	3,250
15	4,200	3,740	34,200	8,420	78,000	4,080	3,910	2,310	1,370	2,620	3,740	3,090
16	4,100	6,620	106,000	7,010	35,100	8,210	3,740	2,310	1,370	2,160	3,580	3,090
17	4,000	9,960	127,000	8,210	35,100	4,960	4,600	2,160	2,620	2,930	3,740	2,930
18	4,400	9,500	210,000	8,210	40,600	4,960	3,410	2,020	1,820	3,090	3,580	2,620
19	4,780	13,000	137,000	10,200	26,600	6,060	3,410	1,880	2,160	3,090	3,250	3,250
20	4,780	17,200	22,100	9,960	15,300	6,430	3,580	1,750	3,250	2,620	3,250	3,090
21	13,000	14,700	14,400	8,840	11,700	6,620	4,600	1,620	6,430	2,770	3,090	3,090
22	9,960	15,300	11,900	8,000	10,200	5,500	5,140	2,020	4,430	2,770	3,090	3,090
23	8,630	32,400	10,900	10,200	9,280	4,430	3,910	2,310	3,090	2,020	3,090	3,250
24	7,800	36,000	11,700	15,000	8,630	7,070	3,580	2,020	3,410	2,930	2,930	3,250
25	7,010	17,900	25,900	13,300	8,000	5,500	3,910	1,880	20,600	2,770	2,770	3,250
26	6,620	17,900	45,400	9,960	7,400	7,600	3,250	1,750	27,400	2,620	2,930	4,080
27	6,240	30,700	49,300	8,210	7,200	6,820	3,410	1,500	13,300	2,770	2,310	3,910
28	6,240	45,400	25,100	7,400	6,060	4,960	2,930	1,250	8,210	2,620	2,930	4,080
29	6,620	50,300	17,500	7,800	7,010	15,000	2,930	1,500	6,620	3,090	2,770	4,960
30	8,630	.....	45,400	8,000	5,870	11,200	3,250	2,020	4,600	1,620	2,770	4,430
31	21,400	.....	58,600	.....	5,500	.....	2,020	3,580	.....	2,310	.....	3,740
1913.												
1	5,140	9,960	14,200	19,200	4,960	9,060	10,400	2,310	5,870	2,020	4,260	3,580
2	5,500	8,210	21,400	14,700	4,260	7,400	9,060	2,020	7,010	2,620	3,580	4,600
3	7,400	7,400	13,000	10,900	4,260	7,010	9,500	2,770	8,630	2,160	3,250	13,000
4	6,620	5,870	9,060	9,060	4,080	7,010	4,260	8,210	11,400	2,310	3,250	22,100
5	7,010	7,400	8,210	7,400	3,910	6,620	4,780	10,900	29,000	2,020	3,410	13,000
6	6,620	6,620	6,620	6,620	5,870	5,140	18,500	9,060	28,200	1,750	3,090	9,060
7	6,620	6,620	5,500	5,870	4,080	4,780	12,500	5,870	13,600	1,500	2,770	7,400
8	6,620	5,870	5,320	4,600	3,410	5,320	7,400	3,410	9,060	1,250	2,930	7,010
9	5,500	4,780	4,780	5,870	3,580	9,960	5,500	2,770	5,140	2,160	5,870	6,240
10	4,780	4,600	4,430	4,600	4,080	9,960	3,740	3,250	3,910	3,090	30,700	7,400
11	4,600	4,080	4,080	4,600	3,740	7,400	3,410	3,910	2,930	3,910	51,300	5,140
12	4,260	4,780	6,620	4,430	3,580	4,960	3,090	3,580	3,250	8,630	32,400	5,870
13	3,910	4,260	6,620	8,630	3,410	6,620	8,210	8,210	2,310	7,010	12,500	3,580
14	3,410	4,780	7,400	45,400	3,740	8,210	5,870	8,210	2,310	3,910	9,500	4,780
15	4,430	4,080	56,400	53,300	3,410	6,620	4,430	5,870	2,460	5,500	7,400	4,430
16	3,910	4,080	77,100	22,100	3,250	5,870	4,600	3,910	1,880	3,740	6,620	3,740
17	3,580	3,910	117,000	14,200	3,580	4,080	3,250	3,910	1,620	2,930	5,870	3,580
18	3,580	3,580	110,000	13,000	3,410	4,600	3,090	4,430	2,310	2,770	5,870	4,080
19	3,410	3,740	22,800	10,900	5,500	3,740	3,090	3,250	2,020	3,090	7,400	3,580
20	3,740	3,580	13,600	9,060	6,620	3,580	3,090	2,160	2,310	2,460	6,620	3,910
21	3,580	3,410	11,400	8,210	6,620	3,580	3,090	2,770	4,780	2,770	5,870	3,580
22	3,910	3,740	10,400	6,620	3,910	3,410	6,620	2,620	3,910	16,600	4,960	3,410
23	3,910	3,910	9,960	7,400	4,260	4,430	4,600	3,580	5,140	9,960	4,600	3,410
24	3,910	3,910	9,060	6,620	14,200	9,060	3,410	4,430	9,960	9,060	4,260	3,910
25	6,620	3,740	8,210	5,870	31,500	13,000	2,620	3,580	6,620	9,060	3,740	7,400
26	10,400	4,260	7,400	5,870	49,300	7,800	2,460	3,580	4,430	22,100	3,580	13,600
27	9,500	4,080	7,800	5,140	40,600	8,630	2,620	2,460	3,090	19,900	2,930	17,200
28	18,500	4,960	9,060	5,140	13,000	9,060	2,460	3,250	2,930	16,600	3,740	17,900
29	25,100	.....	13,000	5,140	17,900	10,400	2,160	2,620	3,090	8,210	3,580	11,900
30	24,300	.....	16,600	5,870	23,600	9,500	2,160	2,770	2,460	6,240	3,580	9,060
31	14,200	.....	10,900	.....	13,000	.....	2,310	4,260	.....	5,320	.....	8,630

NOTE.—Daily discharge determined from a rating curve well defined below 33,300 second-feet and fairly well defined up to 181,000 second-feet. Above 194,000 second-feet the rating curve is assumed a tangent. Discharge Jan. 13–18, 1912, estimated because of ice. A measurement made in 1914 at a lower stage than any previous measurements, indicated that the curve used for discharges below 25,000 second-feet was not correct. Discharges for 1911-12 have therefore been recomputed and supersede those previously published.

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Monthly discharge of Roanoke River at Old Gaston, N. C., for 1911–1913.

[Drainage area, 8,350 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1911.						
December 7–31	37,800	2,460	12,900	1.54	1.43	A.
1912.						
January	21,400	4,000	7,380	.884	1.02	B.
February	50,300	3,740	14,600	1.75	1.89	A.
March	210,000	8,420	38,000	4.55	5.25	A.
April	68,700	7,010	12,400	1.49	1.66	A.
May	78,000	5,500	16,900	2.02	2.33	A.
June	15,000	3,910	6,110	.732	.82	A.
July	16,200	2,020	5,440	.651	.75	A.
August	3,580	1,250	2,200	.263	.30	A.
September	27,400	790	4,460	.534	.60	A.
October	3,580	1,500	2,610	.313	.36	A.
November	36,000	2,160	5,290	.634	.71	A.
December	5,140	2,620	3,590	.430	.50	A.
The year	210,000	790	9,920	1.19	16.19	
1913.						
January	25,100	3,410	7,240	.867	1.00	A.
February	9,960	3,410	5,010	.600	.62	A.
March	117,000	4,080	20,300	2.43	2.80	A.
April	53,300	4,430	11,200	1.34	1.50	A.
May	49,300	3,250	9,700	1.16	1.34	A.
June	13,000	3,410	6,890	.825	.92	A.
July	18,500	2,160	5,230	.626	.72	A.
August	10,900	2,020	4,320	.517	.60	A.
September	29,000	1,620	6,390	.765	.85	A.
October	22,100	1,250	6,150	.737	.85	A.
November	51,300	2,770	8,310	.995	1.11	A.
December	22,100	3,410	7,620	.913	1.05	A.
The year	117,000	1,250	8,220	.984	13.36	

NOTE.—Discharge for 1911-12 supersedes that previously published.

PEEDEE RIVER BASIN.

YADKIN RIVER AT DONNAHA, N. C.

Location.—At toll bridge in Donnaha on road between Donnaha and East Bend, N. C., about a quarter of a mile west of Donnaha railway station, and about 6 miles downstream from mouth of Ararat River, which enters on left side of river. Station about 60 miles upstream from gaging station at Salisbury, N. C.

Records available.—April 11 to December 31, 1913.

Drainage area.—1,600 square miles.

Gage.—Vertical gage in four sections, on left bank 150 feet downstream from left end of toll bridge.

Channel and control.—Channel, sand and bed rock, probably permanent. Current slightly obstructed by two old steel trusses lying about 150 and 400 feet, respectively, below bridge; obstructions probably permanent. Control, a rock ledge extending across river and forming a shoal about 450 feet below gage.

Discharge measurements.—Made from 3-span toll bridge with two piers in stream and two on banks; bridge has steel trestle approaches at both ends. Flood water confined under bridge except during extreme floods above about 28 feet.

Winter flow.—No ice of any importance forms at this station.

Regulation.—None except for a few small milldams on tributaries.

Accuracy.—Rating curve depends largely on three discharge measurements made early in 1914, and is moderately good between gage heights 5 and 7 feet.

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Discharge measurements of Yadkin River at Donnaha, N. C., in 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 15	Warren E. Hall	5.15	1,240
16	do	5.24	1,360
Nov. 29	do	5.23	1,400

Daily gage height, in feet, of Yadkin River at Donnaha, N. C., for 1913.

[J. F. Goolsby, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.9	6.0	6.0	6.0	5.6	5.2	5.4	7.6
2	.....	5.9	5.8	5.6	6.4	5.6	5.2	5.4	8.6
3	.....	5.9	5.8	5.4	6.0	5.8	5.1	5.4	6.8
4	.....	5.9	6.8	6.8	5.8	7.8	5.1	5.4	6.3
5	.....	5.8	6.4	6.2	5.6	7.4	5.1	5.4	5.8
6	.....	5.8	6.2	5.8	5.6	7.8	5.0	5.4	5.9
7	.....	5.8	6.7	5.6	5.7	7.6	5.0	5.4	5.6
8	.....	5.8	6.7	5.6	5.6	7.4	5.0	5.6	5.5
9	.....	6.2	6.8	5.4	5.4	6.9	5.0	7.8	5.4
10	.....	6.0	6.6	5.4	6.6	6.2	5.2	6.4	5.4
11	6.2	6.0	6.6	5.4	5.9	5.8	5.2	6.0	5.4
12	11.8	6.0	6.4	5.4	5.8	5.7	5.6	5.6	5.4
13	9.5	5.9	6.2	5.4	5.6	5.4	5.8	5.5	5.4
14	8.1	5.8	6.1	5.3	5.5	5.1	5.4	5.4	5.3
15	7.3	5.8	6.0	5.3	5.5	5.0	5.2	5.4	5.4
16	7.1	5.8	5.8	5.3	5.4	5.1	5.2	5.4	5.4
17	6.8	5.9	5.6	5.3	5.4	5.3	5.2	5.3	5.4
18	6.8	6.3	5.6	5.3	5.4	5.3	5.2	5.3	5.3
19	6.4	6.4	5.4	6.1	5.4	5.2	6.0	5.3	5.4
20	6.4	6.2	5.4	5.8	5.3	5.2	11.0	5.2	5.6
21	6.2	6.1	5.3	5.6	5.3	5.4	6.8	5.2	5.6
22	6.1	6.6	5.3	5.5	5.4	7.4	5.9	5.2	5.6
23	6.1	9.5	5.3	5.4	5.4	5.6	5.8	5.2	5.5
24	6.1	14.5	5.3	5.4	10.8	5.4	5.8	5.2	5.4
25	6.1	12.8	6.5	5.4	10.0	5.4	6.8	5.2	5.5
26	6.0	11.4	7.1	5.9	9.6	5.3	5.8	5.2	6.5
27	6.0	8.0	7.8	5.7	8.0	5.3	5.6	5.2	6.3
28	6.0	7.1	6.6	5.6	8.0	5.3	5.5	5.2	5.9
29	6.0	6.9	5.9	5.5	7.3	5.3	5.5	5.2	5.6
30	5.9	6.5	5.5	5.5	6.1	5.3	5.5	5.2	5.6
31	.....	6.2	.....	6.1	5.7	.....	5.4	.....	6.5

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Daily discharge, in second-feet, of Yadkin River at Donnaha, N. C., for 1913.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2,320	2,470	2,470	2,470	1,880	1,320	1,600	4,960
2	.....	2,320	2,170	1,880	3,070	1,880	1,320	1,600	6,610
3	.....	2,320	2,170	1,600	2,470	2,170	1,180	1,600	3,680
4	.....	2,320	3,680	3,680	2,170	5,290	1,180	1,600	2,920
5	.....	2,170	3,070	2,770	1,880	4,640	1,180	1,600	2,170
6	.....	2,170	2,770	2,170	1,880	5,290	1,050	1,600	2,320
7	.....	2,170	3,530	1,880	2,020	4,960	1,050	1,600	1,880
8	.....	2,170	3,530	1,880	1,880	4,640	1,050	1,880	1,740
9	.....	2,770	3,680	1,600	1,600	3,840	1,050	5,290	1,600
10	.....	2,470	3,370	1,600	3,370	2,770	1,320	3,070	1,600
11	2,770	2,470	3,370	1,600	2,320	2,170	1,320	2,470	1,600
12	12,000	2,470	3,070	1,600	2,170	2,030	1,880	1,880	1,600
13	8,140	2,320	2,770	1,600	1,880	1,600	2,170	1,740	1,600
14	5,770	2,170	2,620	1,460	1,740	1,180	1,600	1,600	1,460
15	4,480	2,170	2,470	1,460	1,740	1,050	1,320	1,600	1,600
16	4,160	2,170	2,170	1,460	1,600	1,180	1,320	1,600	1,600
17	3,680	2,320	1,880	1,460	1,600	1,460	1,320	1,460	1,600
18	3,680	2,920	1,880	1,460	1,600	1,460	1,320	1,460	1,460
19	3,070	3,070	1,600	2,620	1,600	1,320	2,470	1,460	1,600
20	3,070	2,770	1,600	2,170	1,460	1,320	10,700	1,320	1,880
21	2,770	2,620	1,460	1,880	1,460	1,600	3,680	1,320	1,880
22	2,620	3,370	1,460	1,740	1,600	4,640	2,320	1,320	1,880
23	2,620	8,140	1,460	1,600	1,600	1,880	2,170	1,320	1,740
24	2,620	16,600	1,460	1,600	10,400	1,600	2,170	1,320	1,600
25	2,620	13,800	3,220	1,600	8,990	1,600	3,680	1,320	1,740
26	2,470	11,400	4,160	2,320	8,310	1,460	2,170	1,320	3,220
27	2,470	5,610	5,290	2,030	5,610	1,460	1,880	1,320	2,920
28	2,470	4,160	3,370	1,880	5,610	1,460	1,740	1,320	2,320
29	2,470	3,840	2,320	1,740	4,480	1,460	1,740	1,320	1,880
30	2,320	3,220	1,740	1,740	2,620	1,460	1,740	1,320	1,880
31	.....	2,770	.....	2,620	2,030	.....	1,600	.....	3,220

NOTE.—Daily discharge determined from a rating curve well defined between 1,000 and 4,000 second-feet; below 1,000 second-feet the curve is based on a fairly accurate determination of the point of zero flow; above 5,000 second-feet it is approximate.

Monthly discharge of Yadkin River near Donnaha, N. C., for 1913.

[Drainage area, 1,600 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
April 11-30	12,000	2,320	3,810	2.38	1.77	B.
May	16,600	2,170	3,990	2.49	2.87	B.
June	5,290	1,460	2,660	1.66	1.85	A.
July	3,680	1,460	1,910	1.19	1.37	A.
August	10,400	1,460	3,010	1.88	2.17	A.
September	5,290	1,050	2,360	1.48	1.65	A.
October	10,700	1,050	2,000	1.25	1.44	A.
November	5,290	1,320	1,710	1.07	1.19	A.
December	6,610	1,460	2,250	1.41	1.63	A.

YADKIN RIVER NEAR SALISBURY, N. C.

Location.—At highway bridge known as the Piedmont Toll Bridge, 1,000 feet above Southern Railway bridge, 6 miles east of Salisbury, and about 5 miles below mouth of South Yadkin River.

Records available—September 24, 1895, to December 31, 1909; September 1, 1911, to December 31, 1913.

Drainage area.—3,400 square miles.

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Gage.—Standard chain gage attached to highway bridge. From the date of establishment to May 31, 1899, the gage was at the Southern Railway bridge, and from the latter date it was at the highway bridge until moved back to the railroad bridge early in the year 1903, where it remained until the end of the year 1905. Since January 1, 1906, the gage has been at the highway bridge on the same datum as originally established there in 1899. The last gage at the railroad bridge read the same as the gage at the highway bridge at gage height 3.2 feet, but was not the same for higher and lower stages. Datum of the original gage at the railroad bridge somewhat uncertain.

Channel and control.—Channel wide and rather rough; control, a rock ledge about 500 feet below bridge, extending entirely across river.

Discharge measurements.—Made from highway bridge. During the time that the gage was at the railroad bridge most of the measurements were made from that bridge.

Winter flow.—Ice has little if any effect at this station.

Regulation.—Flow during low stages may be slightly affected by developed powers on the river and tributaries above station.

Accuracy.—Owing to the fact that station has an excellent natural control the rating curve for low and medium stages is good.

The following discharge measurement was made by Warren E. Hall:
February 21: Gage height, 2.71 feet; discharge, 3,550 second-feet.

Daily gage height, in feet, of Yadkin River near Salisbury, N. C., for 1913.

[J. T. Yarbrough, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	3.0	4.8	3.8	2.7	2.8	2.2	2.4	3.0	2.4	2.4	2.85
2	2.4	2.9	3.6	3.3	2.6	2.75	2.2	2.7	2.4	2.25	2.3	6.5
3	2.4	2.8	3.1	3.0	2.5	2.65	2.15	4.0	2.25	2.2	2.4	5.4
4	2.6	2.8	2.85	3.0	2.55	2.8	3.4	4.1	4.7	2.0	2.2	3.6
5	2.7	2.8	2.6	2.9	2.45	2.9	3.6	2.8	5.4	2.1	2.3	3.0
6	2.5	2.7	2.65	2.8	2.5	2.7	2.6	2.55	4.1	2.05	2.2	2.7
7	2.4	2.6	2.55	2.7	2.5	2.6	2.4	2.65	3.2	2.1	2.3	2.8
8	2.35	2.5	2.5	2.7	2.5	2.9	2.3	2.5	2.6	2.0	2.2	3.0
9	2.4	2.5	2.4	2.75	2.6	2.95	2.0	2.1	3.0	2.1	5.0	2.85
10	2.4	2.5	2.75	2.8	2.6	2.7	2.1	4.0	2.85	2.2	5.1	2.55
11	2.2	2.4	3.3	2.9	2.7	2.7	2.1	4.0	2.45	2.3	3.8	2.6
12	2.3	2.7	3.2	5.1	2.55	2.6	2.1	2.8	2.2	2.2	2.85	2.4
13	2.4	2.7	2.85	7.4	2.45	2.7	2.3	2.8	2.15	2.6	2.65	2.5
14	2.4	2.5	5.9	5.4	2.45	2.75	2.3	2.85	2.05	2.2	2.5	2.4
15	2.3	2.4	13.1	4.2	2.3	2.35	2.2	2.65	2.2	2.1	2.5	2.5
16	2.25	2.4	15.4	4.0	2.4	2.4	2.1	2.5	2.0	2.0	2.4	2.25
17	2.25	2.4	10.3	3.7	2.45	2.35	2.1	2.35	2.25	2.1	2.5	2.4
18	2.2	2.35	4.8	3.4	2.65	2.4	2.1	2.2	2.3	1.95	2.4	2.3
19	2.2	2.35	3.9	3.2	2.9	2.3	1.9	2.0	2.5	2.15	2.45	2.4
20	2.35	2.3	3.7	3.1	3.0	2.2	2.4	3.0	2.35	5.0	2.3	2.2
21	2.3	2.7	3.9	3.0	2.8	2.3	3.3	4.5	2.65	5.0	2.4	2.4
22	2.35	2.7	4.0	2.9	3.4	2.35	2.4	4.0	4.9	3.2	2.2	2.3
23	2.4	2.7	3.6	2.9	3.0	2.5	2.0	2.65	3.8	2.7	2.35	2.8
24	2.9	2.6	3.2	2.8	7.8	2.85	2.1	4.3	2.8	2.5	2.3	2.65
25	3.9	2.5	3.0	2.7	6.5	2.85	2.2	3.9	2.6	4.8	2.25	2.65
26	3.6	2.4	3.2	2.9	4.0	3.3	2.05	2.4	2.3	4.3	2.2	3.7
27	4.1	2.6	3.8	2.65	3.4	2.85	2.2	2.2	2.4	3.3	2.3	4.0
28	7.1	5.0	6.2	2.85	6.0	2.55	2.15	2.4	2.2	2.8	2.2	3.2
29	5.5	.....	4.7	2.75	5.0	2.5	2.1	2.2	2.3	2.7	2.25	2.9
30	3.9	.....	4.4	2.7	3.5	2.4	2.8	4.5	2.3	2.6	2.2	3.2
31	3.2	.....	4.2	.....	3.0	.....	2.6	4.6	.....	2.5	.....	3.2

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Daily discharge, in second-feet, of Yadkin River near Salisbury, N. C., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,210	4,400	11,300	7,210	3,500	3,790	2,170	2,660	4,400	2,660	2,660	3,940
2	2,660	4,090	6,460	5,390	3,210	3,640	2,170	3,500	2,660	2,290	2,410	19,200
3	2,660	3,790	4,720	4,400	2,930	3,360	2,060	7,980	2,290	2,170	2,660	13,900
4	3,210	3,790	3,940	4,400	3,070	3,790	5,740	8,370	10,800	1,730	2,170	6,460
5	3,500	3,790	3,210	4,090	2,800	4,090	6,460	3,790	13,900	1,940	2,410	4,400
6	2,930	3,500	3,360	3,790	2,930	3,500	3,210	3,070	8,370	1,840	2,170	3,500
7	2,660	3,210	3,070	3,500	2,930	3,210	2,660	3,360	5,050	1,940	2,410	3,790
8	2,540	2,930	2,930	3,500	2,930	4,090	2,410	2,930	3,210	1,730	2,170	4,400
9	2,660	2,930	2,660	3,640	3,210	4,240	1,730	1,940	4,400	1,940	12,200	3,940
10	2,660	2,930	3,640	3,790	3,210	3,500	1,940	7,980	3,940	2,170	12,600	3,070
11	2,170	2,660	5,390	4,090	3,500	3,500	1,940	7,980	2,800	2,410	7,210	3,210
12	2,410	3,500	5,050	12,600	3,070	3,210	1,940	3,790	2,170	2,170	3,940	2,660
13	2,660	3,500	3,940	23,800	2,800	3,500	2,410	3,790	2,060	3,210	3,360	2,930
14	2,660	2,930	16,300	13,900	2,800	3,640	2,410	3,940	1,840	2,170	2,930	2,660
15	2,410	2,660	60,700	8,770	2,410	2,540	2,170	3,360	2,170	1,940	2,930	2,930
16	2,290	2,660	77,200	7,980	2,660	2,660	1,940	2,930	1,730	1,730	2,660	2,540
17	2,290	2,660	41,300	6,830	2,800	2,540	1,940	2,540	2,290	1,940	2,930	2,660
18	2,170	2,540	11,300	5,740	3,360	2,660	1,940	2,170	2,410	1,630	2,660	2,410
19	2,170	2,540	7,590	5,050	4,090	2,410	1,530	1,730	2,930	2,060	2,800	2,660
20	2,540	2,410	6,830	4,720	4,400	2,170	2,660	4,400	2,540	12,200	2,410	2,170
21	2,410	3,500	7,590	4,400	3,790	2,410	5,390	9,990	3,360	12,200	2,630	2,660
22	2,540	3,500	7,980	4,090	5,740	2,540	2,660	7,980	11,700	5,050	2,170	2,410
23	2,660	3,500	6,460	4,090	4,400	2,930	1,730	3,360	7,210	3,500	2,540	3,790
24	4,090	3,210	5,050	3,790	25,900	3,940	1,940	9,170	3,790	2,930	2,410	3,360
25	7,590	2,930	4,400	3,500	19,200	3,940	2,170	7,590	3,210	11,300	2,290	3,940
26	6,460	2,660	5,050	4,090	7,980	5,390	1,840	2,660	2,410	9,170	2,170	3,500
27	8,370	3,210	7,210	3,360	5,740	3,940	2,170	2,170	2,660	5,390	2,410	7,980
28	22,200	12,200	17,700	3,940	16,800	3,070	2,060	2,660	2,170	3,790	2,170	5,050
29	14,400	.....	10,800	3,640	12,200	2,930	2,170	2,170	2,410	3,500	2,290	4,090
30	7,590	.....	9,580	3,500	6,100	2,660	3,790	9,990	2,410	3,210	2,170	5,050
31	5,050	.....	8,770	.....	4,400	.....	3,210	10,400	.....	2,930	.....	5,050

NOTE.—Daily discharge determined from a rating curve fairly well defined below 22,000 second-feet.

Monthly discharge of Yadkin River near Salisbury, N. C., for 1913.

[Drainage area, 3,400 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	22,200	2,170	4,380	1.29	1.49	B.
February	12,200	2,410	3,500	1.03	1.07	A.
March	77,200	2,660	12,000	3.53	4.07	B.
April	23,800	3,500	5,850	1.72	1.92	B.
May	25,900	2,410	5,640	1.66	1.91	B.
June	5,390	2,170	3,330	.979	1.09	A.
July	6,460	1,530	2,600	.765	.88	A.
August	10,400	1,730	4,850	1.43	1.65	B.
September	13,900	1,730	4,110	1.21	1.35	A.
October	12,200	1,630	3,700	1.09	1.26	A.
November	12,600	2,170	3,360	.988	1.10	A.
December	19,200	2,170	4,530	1.33	1.53	B.
The year	77,200	1,530	4,840	1.42	19.32	

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SAVANNAH RIVER BASIN.

TALLULAH RIVER AT MATHIS, GA.

Location.—About a quarter of a mile southeast of Mathis station on the Tallulah Falls Railway; about 900 feet below mouth of Tiger Creek, about 1 mile below the Mathis storage dam of the Georgia Railway & Power Co., now under construction, and about 5 miles upstream from Tallulah Falls, Ga., where a station was formerly located.

Records available.—October 31, 1912, to December 31, 1913.

Drainage area.—186 square miles.

Gage.—Step gage, composed of eight vertical sections on left bank in a line normal to stream, installed March 27, 1913, about 400 feet below site of original gage but at same datum. Original gage had been moved 20 feet upstream February 1, 1913, on account of construction work on bridge cribs, but was washed out during flood of March 16, 1913.

Channel and control.—Channel fairly permanent, though owing to construction of bridge crib above, silt tends to collect around the gage. Bottom of sand, gravel, and bowlders. Control, bowlder and gravel bar about 150 feet below gage; practically permanent.

Discharge measurements.—Usually made from a rough railroad trestle just above gage. Section is very rough and current irregular. One measurement was made by using a swinging bridge above mouth of Tiger Creek and adding measurement made of Tiger Creek, at a foot log half a mile above gage.

Floods.—March 27, 1913; crest of flood 9.5 feet.

Winter flow.—Little affected by ice.

Regulation.—Small diurnal fluctuation caused by operation of small mills on Tiger Creek. When Mathis storage dam, 1 mile above on Tallulah River, is completed, the gage heights will be affected greatly.

Accuracy.—Backwater from construction bridge cribs directly over original gage invalidates records from February 1 to March 15, 1913; readings reliable after March 27. Gage readings prior to February 1, 1913, probably valueless, as no rating curve had been made before that time.

Cooperation.—Gage-height record furnished by Northern Contracting Co., builders of the Mathis Dam.

Discharge measurements of Tallulah River at Mathis, Ga., in 1913.

[Warren E. Hall, hydrographer.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Mar. 27[a]	7.76	7,050	Sept. 5	1.48	304
27[a]	7.33	6,580	5	2.08	63[illegible]
27[a]	5.65	3,550	6	1.51	3[illegible]
May 9	1.85	575			

[a] Measured by floats; coefficient used, 0.90.

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Daily gage height, in feet, of Tallulah River at Mathis, Ga., for 1913.

[Miles Phillips, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.95	2.25	3.4	2.95	1.9	1.7	1.45	1.2	1.0	1.1	1.0	1.65
2	1.9	2.2	3.2	2.8	1.9	1.65	1.45	1.3	1.0	1.0	1.0	1.5
3	1.95	2.65	3.1	2.75	1.9	1.6	1.3	1.2	.8	.8	1.0	1.15
4	1.9	2.65	3.0	2.7	1.9	1.7	1.35	1.3	.7	.7	1.0	1.2
5	1.9	2.45	2.95	2.6	1.9	1.7	1.4	1.2	1.2	.7	.95	1.15
6	1.85	2.3	2.9	2.55	1.9	2.3	1.55	1.1	1.6	.7	1.1	1.1
7	1.9	2.3	2.85	2.5	1.9	2.4	1.25	1.15	1.2	.7	1.1	2.0
8	2.1	2.3	2.9	2.55	1.9	2.65	1.1	1.45	1.1	.75	1.1	1.45
9	2.05	2.3	2.9	2.75	1.9	2.6	1.5	1.5	1.0	.8	1.1	1.25
10	1.9	2.35	3.7	2.65	1.9	2.25	1.2	1.4	.9	.8	1.1	1.2
11	1.95	2.8	3.6	2.9	1.85	1.5	1.2	1.4	.85	.8	1.1	1.2
12	2.3	3.3	3.3	2.65	1.85	1.8	1.7	1.3	.75	.8	.9	1.2
13	2.25	3.0	3.4	2.8	1.85	1.7	1.45	1.3	.8	.8	.9	1.1
14	2.05	2.85	6.3	2.55	1.8	1.65	1.3	1.25	.9	.8	.9	1.1
15	2.05	2.85	5.8	2.5	1.8	1.6	1.25	1.2	1.05	.8	.9	1.1
16	2.05	2.75	.....	2.5	1.8	1.6	1.2	1.2	1.2	.8	.9	1.1
17	2.1	2.7	.....	2.45	2.0	1.5	1.1	1.2	1.2	.8	.9	1.0
18	2.15	2.6	.....	2.45	1.8	1.5	1.1	1.2	1.1	.8	.9	.95
19	2.0	2.6	.....	2.3	2.0	1.75	1.1	1.0	1.0	.85	.9	1.1
20	1.95	3.3	.....	2.3	1.8	1.3	1.1	1.1	1.15	1.35	.85	1.0
21	2.05	3.2	.....	2.3	1.7	1.55	1.25	1.25	1.5	2.0	.8	.9
22	2.0	3.0	.....	2.2	1.7	1.5	2.4	1.0	1.1	.9	.8	.9
23	2.0	2.85	.....	2.2	4.4	1.5	1.2	1.55	1.1	.9	.8	1.4
24	2.55	2.75	.....	2.15	3.1	1.45	1.2	1.0	1.0	2.0	.8	1.2
25	2.45	2.8	.....	2.1	2.25	1.4	1.8	1.05	1.0	1.35	.8	2.35
26	2.25	2.75	.....	2.1	2.05	1.4	1.55	1.0	.95	1.2	.8	1.85
27	3.4	5.4	6.9	2.1	2.0	1.4	2.85	1.05	.8	1.15	.8	1.5
28	2.85	4.8	3.9	2.1	1.45	1.4	1.45	1.0	.75	1.3	.8	1.35
29	2.55	.....	3.4	2.1	1.8	1.4	1.35	1.1	1.15	1.1	.8	1.7
30	2.4	.....	3.4	2.1	1.75	1.55	1.2	1.2	1.7	1.1	1.1	1.85
31	2.35	.....	3.2	.....	1.7	.....	1.2	1.25	.....	1.1	.....	1.7

NOTE.—Gage destroyed by flood Mar. 14 and replaced Mar. 27.

Daily discharge, in second-feet, of Tallulah River at Mathis, Ga., for 1913.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1,150	570	476	369	270	200	234	200	454
2	.....	1,050	570	454	369	308	200	200	200	390
3	.....	1,020	570	432	308	270	138	138	200	252
4	.....	900	570	476	328	308	110	110	200	270
5	.....	936	570	476	348	270	270	110	184	252
6	.....	908	570	772	411	234	432	110	234	234
7	.....	880	570	826	289	252	270	110	234	620
8	.....	908	570	965	234	369	234	124	234	369
9	.....	1,020	570	936	390	390	200	138	234	289
10	.....	965	570	746	270	348	168	138	234	270
11	.....	1,120	546	390	270	348	153	138	234	270
12	.....	965	546	522	476	308	124	138	168	270
13	.....	1,050	546	476	369	308	138	138	168	234
14	.....	908	522	454	308	289	168	138	168	234
15	.....	880	522	432	289	270	217	138	168	234
16	.....	880	522	432	270	270	270	138	168	234
17	.....	853	620	390	234	270	270	138	168	200
18	.....	853	522	390	234	270	234	138	168	184
19	.....	772	620	499	234	200	200	153	168	234
20	.....	772	522	308	234	234	252	328	153	200
21	.....	772	476	411	289	289	390	620	138	168
22	.....	720	476	390	826	200	234	168	138	168
23	.....	720	2,210	390	270	411	234	168	138	348
24	.....	695	1,250	369	270	200	200	620	138	270
25	.....	670	746	348	522	217	200	328	138	799
26	.....	670	645	348	411	200	184	270	138	546
27	5,600	670	620	348	1,080	217	138	252	138	398
28	1,810	670	369	348	369	200	124	308	138	320
29	1,450	670	522	348	328	234	252	234	138	476
30	1,450	670	499	411	270	270	476	234	234	546
31	1,310	.....	476	.....	270	289	.....	234	.....	476

NOTE.—Daily discharge determined from a fairly well defined rating curve.

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Monthly discharge of Tallulah River at Mathis, Ga., for 1913.

[Drainage area, 186 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
April	1,150	670	860	4.62	5.16	B.
May	2,210	309	628	3.38	3.90	A.
June	965	308	485	2.61	2.91	A.
July	1,080	234	359	1.93	2.23	A.
August	411	200	275	1.48	1.71	A.
September	476	110	223	1.20	1.34	B.
October	620	110	208	1.12	1.29	B.
November	234	138	179	.962	1.07	B.
December	799	168	329	1.77	2.04	A.

BROAD RIVER (OF GEORGIA) NEAR CARLTON, GA.

Location.—At the Seaboard Air Line Railway bridge 3 miles east of Carlton, Ga., and 2 miles above the mouth of South Fork.

Records available.—May 27, 1897, to December 31, 1913.

Drainage area.—762 square miles.

Gage.—Standard chain gage attached to railroad bridge.

Channel and control.—The bed of the stream is sand and gravel and may be slightly changeable. Left bank overflows for about 400 feet at gage height 16 feet.

Discharge measurements.—Made from upstream side of deck railroad bridge.

Regulation.—Flow affected little or not at all by artificial control.

Cooperation.—Gage-height record furnished by United States Weather Bureau.

No discharge measurements have been made at this station since 1910; conditions that may have affected the rating curve are not known, and estimates for 1913 are withheld.

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Daily gage height, in feet, of Broad River (of Georgia) near Carlton, Ga., for 1913.

[M. C. Power, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	2.7	6.4	2.8	2.1	.....	.....	3.8	2.9	4.6	2.3	3.0
2	2.2	2.7	4.4	2.4	1.9	.....	.....	3.6	2.6	3.5	2.4	3.5
3	2.4	2.4	3.5	2.6	1.8	.....	.....	3.0	2.7	2.8	2.2	2.9
4	2.7	5.6	3.0	2.3	2.2	.....	.....	2.8	3.1	2.45	2.0	2.5
5	2.3	4.4	2.5	2.1	2.0	.....	.....	2.5	3.5	2.25	2.3	2.5
6	2.0	3.3	2.2	2.8	1.9	.....	.....	5.7	3.9	2.45	2.2	2.1
7	2.2	2.7	2.4	2.5	2.1	.....	.....	4.0	4.0	2.1	2.5	2.9
8	2.4	2.2	2.2	2.7	1.9	.....	.....	3.8	3.7	2.3	2.3	2.8
9	2.1	2.5	2.5	2.2	2.2	.....	.....	2.9	2.35	2.5	2.6	2.7
10	2.3	2.2	2.9	2.5	2.0	.....	.....	3.1	2.15	2.8	2.2	2.6
11	2.2	2.4	5.0	2.8	2.3	.....	2.45	3.5	2.45	2.6	2.4	2.5
12	2.2	5.7	4.5	4.9	2.1	.....	2.8	2.7	2.3	2.3	2.3	2.8
13	2.0	4.6	5.6	4.1	1.9	.....	2.9	3.5	2.05	2.1	2.2	2.9
14	2.4	3.4	8.3	3.7	2.2	.....	3.2	2.9	2.5	2.4	2.5	2.7
15	2.2	2.3	19.1	4.2	2.0	.....	2.7	3.1	2.8	2.2	2.3	2.8
16	2.1	2.6	14.4	3.4	1.8	.....	2.45	2.7	3.2	2.5	2.6	2.8
17	2.3	2.2	6.9	2.9	2.2	.....	2.15	2.2	3.6	2.8	2.4	2.7
18	2.5	2.4	5.3	2.6	2.2	.....	2.35	2.8	4.0	2.6	2.2	2.7
19	2.4	2.6	4.2	2.2	2.5	.....	2.15	2.8	3.6	2.7	2.5	2.7
20	2.2	3.4	3.1	2.3	2.8	.....	2.25	2.6	2.9	4.3	2.4	2.7
21	2.5	3.8	3.6	2.1	2.4	.....	2.6	2.2	3.0	3.8	2.3	2.7
22	2.3	4.3	4.7	2.4	2.1	.....	3.1	2.7	2.8	3.3	2.2	2.7
23	2.1	3.3	4.1	2.2	2.9	.....	4.3	3.0	2.5	3.0	2.6	2.7
24	3.7	2.4	3.5	2.0	3.4	.....	3.9	3.5	2.9	4.1	2.4	3.1
25	4.7	2.2	2.8	1.8	3.1	.....	2.6	2.5	2.6	5.5	2.3	3.7
26	3.9	2.5	3.1	2.0	2.7	.....	3.5	2.25	2.25	4.3	2.1	4.4
27	5.5	2.8	3.9	2.2	2.4	.....	4.6	3.0	3.0	3.3	2.4	4.1
28	7.9	3.5	3.4	2.4	2.2	.....	3.9	2.8	2.35	3.8	2.6	3.4
29	7.0	.....	2.7	2.2	.....	.....	2.7	2.5	2.2	3.3	2.4	3.2
30	5.2	.....	2.9	2.0	.....	.....	3.8	2.35	4.5	3.0	2.7	9.3
31	3.2	.....	2.5	.....	.....	.....	4.3	4.0	.....	2.7	.....	6.7

ALTAMAHA RIVER BASIN.

OCMULGEE RIVER NEAR JACKSON, GA.

Location.—At Pittmans Ferry, 8 miles southeast of Jackson, Ga., half a mile above mouth of Yellow Water Creek, and a short distance below Heards Creek; 1½ miles below dam and power plant of the Central Georgia Power Co.

Records available.—May 18, 1906, to December 31, 1913.

Drainage area.—1,400 square miles.

Gage.—Automatic gage installed near the ferry landing on right bank by Central Georgia Power Co. The gage used previous to 1913 was a vertical staff in three sections on the right bank of river, upstream side of ferry landing. Both gages read the same and the staff gage is read twice a day as a check on the automatic gage.

Channel and control.—Bottom sandy; shifts considerably but the shifting has little if any effect on the rating curve, as the control is a rocky ledge about 400 feet below the gage.

Discharge measurements.—Made at ferry, either from the ferry boat or a small boat held in place by the ferry cable.

Regulation.—Flow at low stages since 1911 greatly affected by operation of plant of Central Georgia Power Co.

Accuracy.—Station fairly well rated; possible errors due to effect of power regulation eliminated by means of automatic gage record.

Cooperation.—Gage heights furnished by Central Georgia Power Co.

The following discharge measurement was made by Warren E. Hall:

June 5: Gage height, 5.09 feet; discharge, 1,980 second-feet.

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Daily gage height, in feet, of Ocmulgee River near Jackson, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.0	5.6	6.2	5.7	4.9	4.36	4.75	4.8	4.27	4.49	4.55	4.5
2	5.0	5.35	5.9	5.45	4.75	4.65	4.9	4.6	4.95	4.65	4.40	4.6
3	5.0	5.6	5.8	5.25	4.6	4.65	4.9	4.55	4.95	4.65	4.55	4.6
4	4.75	5.6	5.4	5.25	4.47	4.9	4.75	5.0	4.6	4.6	4.33	4.55
5	4.55	5.8	5.3	5.2	4.7	4.95	4.7	4.7	4.6	4.41	4.27	4.6
6	4.85	5.7	5.2	5.15	4.65	5.05	4.5	4.7	4.55	4.7	4.28	4.40
7	4.85	5.4	5.1	5.25	4.65	5.05	4.8	4.6	4.37	4.7	4.30	4.32
8	4.85	5.2	4.9	5.2	4.6	5.4	4.8	4.75	4.55	4.7	4.29	4.45
9	4.8	4.9	4.7	5.1	4.6	5.8	4.9	4.7	4.55	4.7	4.19	4.7
10	4.7	5.2	5.1	4.9	4.5	5.5	4.85	4.65	4.55	4.65	4.41	4.7
11	4.6	5.1	5.4	5.15	4.27	5.25	4.75	4.8	4.65	4.6	4.33	4.7
12	4.4	5.2	5.6	5.6	4.55	5.15	4.7	5.15	4.6	4.24	4.33	4.8
13	4.85	5.35	6.6	5.3	4.55	5.0	4.45	5.1	4.55	4.65	4.35	4.40
14	4.9	5.3	9.2	5.4	4.65	4.9	4.65	4.85	4.45	4.55	4.33	4.35
15	4.75	5.1	18.4	5.2	4.6	4.65	4.8	4.9	4.65	4.33	4.36	4.7
16	4.75	4.85	17.9	5.1	4.55	4.95	4.75	4.7	4.65	4.32	4.33	4.8
17	4.6	5.2	12.6	4.8	4.5	4.95	4.8	4.15	4.7	4.28	4.45	4.75
18	4.55	5.0	8.5	4.8	4.5	4.95	4.7	4.6	4.7	4.27	4.36	4.9
19	4.37	5.0	6.9	4.7	4.9	4.85	4.75	4.8	4.9	4.03	4.21	4.85
20	4.75	5.0	6.3	4.6	4.85	4.9	4.7	4.40	4.65	4.32	4.25	4.6
21	4.7	5.1	6.6	4.75	4.85	4.8	4.9	4.6	4.49	4.37	4.27	4.5
22	4.6	5.2	7.1	4.7	4.8	4.48	4.7	4.8	5.05	4.34	4.18	4.55
23	4.6	5.1	6.6	4.65	4.7	4.75	4.47	4.65	4.6	4.40	3.96	4.35
24	4.8	5.3	6.1	4.65	4.85	4.85	4.47	3.95	4.7	4.36	4.25	4.18
25	5.35	5.2	5.8	4.85	4.9	4.75	4.49	4.75	4.7	4.29	4.27	4.09
26	5.55	5.1	5.6	4.8	5.0	4.9	4.28	4.6	4.7	4.27	4.28	4.15
27	6.3	5.2	6.2	4.65	4.95	4.9	4.10	4.6	4.65	4.17	4.19	4.22
28	7.4	5.8	6.8	4.85	4.85	4.9	4.33	4.7	4.6	4.55	4.21	4.25
29	7.4	.....	6.4	4.9	4.75	4.65	4.9	4.6	4.8	4.6	4.06	4.8
30	6.6	.....	4.9	4.85	4.75	4.75	4.95	4.48	4.7	4.6	3.91	4.8
31	5.9	.....	4.8	.....	4.7	.....	4.8	3.95	.....	4.55	.....	4.8

NOTE.—Automatic gage out of order; staff gage read Jan. 1–5, Aug. 1–31, Sept. 22, and Dec. 1–31. Individual readings during these periods may be somewhat in error because of regulation of flow by operation of the power plant.

Daily discharge, in second-feet, of Ocmulgee River near Jackson, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,820	3,000	4,280	3,260	1,620	742	1,330	1,420	638	912	1,000	925
2	1,820	2,540	3,660	2,740	1,330	1,160	1,620	1,080	1,720	1,160	790	1,080
3	1,820	3,050	3,460	2,330	1,080	1,160	1,620	1,000	1,720	1,160	1,000	1,080
4	1,330	3,050	2,640	2,330	884	1,620	1,330	1,820	1,080	1,080	706	1,000
5	1,000	3,460	2,440	2,230	1,240	1,720	1,240	1,240	1,080	804	638	1,080
6	1,520	3,260	2,230	2,130	1,160	1,920	925	1,240	1,000	1,240	649	790
7	1,520	2,640	2,020	2,330	1,160	1,920	1,420	1,080	754	1,240	670	694
8	1,520	2,230	1,620	2,230	1,080	2,640	1,420	1,330	1,000	1,240	660	895
9	1,420	1,620	1,240	2,020	1,080	3,460	1,620	1,240	1,000	1,240	556	1,240
10	1,240	2,230	2,020	1,620	925	2,840	1,520	1,160	1,000	1,160	804	1,240
11	1,080	2,020	2,640	2,130	638	2,330	1,330	1,420	1,160	1,080	706	1,240
12	790	2,230	3,050	3,050	1,000	2,130	1,240	2,130	1,080	607	706	1,420
13	1,520	2,540	5,100	2,440	1,000	1,820	858	2,020	1,000	1,160	730	790
14	1,620	2,440	10,400	2,640	1,160	1,620	1,160	1,520	858	1,000	706	730
15	1,330	2,020	21,200	2,230	1,080	1,160	1,420	1,620	1,160	706	742	1,240
16	1,330	1,520	21,100	2,020	1,000	1,720	1,330	1,240	1,160	694	706	1,420
17	1,080	2,230	17,400	1,420	925	1,720	1,420	518	1,240	649	858	1,330
18	1,000	1,820	9,000	1,420	925	1,720	1,240	1,080	1,240	638	742	1,620
19	754	1,820	5,720	1,240	1,620	1,520	1,330	1,420	1,620	414	576	1,320
20	1,330	1,820	4,480	1,080	1,520	1,620	1,240	790	1,160	694	618	1,080
21	1,240	2,020	5,100	1,330	1,520	1,420	1,620	1,080	912	754	638	925
22	1,080	2,230	6,120	1,240	1,420	898	1,240	1,420	1,920	718	546	1,080
23	1,080	2,020	5,100	1,160	1,240	1,330	884	1,160	1,080	790	362	720
24	1,420	2,440	4,080	1,160	1,520	1,520	884	355	1,240	742	618	546
25	2,540	2,230	3,460	1,520	1,620	1,330	912	1,330	1,240	660	638	390
26	2,950	2,020	3,050	1,420	1,820	1,620	649	1,080	1,240	638	649	535
27	4,480	2,230	4,280	1,160	1,720	1,620	470	1,080	1,160	536	556	394
28	6,740	3,460	5,510	1,520	1,520	1,620	706	1,240	1,080	1,000	576	615
29	6,740	.....	4,690	1,620	1,330	1,160	1,620	1,080	1,420	1,080	438	1,420
30	5,100	.....	1,620	1,520	1,330	1,330	1,720	898	1,240	1,080	327	1,420
31	3,660	.....	1,420	.....	1,240	.....	1,400	355	.....	1,000	.....	1,420

NOTE.—Daily discharge determined from a rating curve fairly well defined below 10,000 second-feet. During the periods Jan. 1–5, Aug. 1–31, Sept. 22, and Dec. 1–31, when staff gage was used, discharges for individual days may be somewhat in error because of regulation of flow by operation of power plant.

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Monthly discharge of Ocmulgee River near Jackson, Ga., for 1913.

[Drainage area, 1,400 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	6,740	754	2,060	1.47	1.69	B.
February	3,460	1,520	2,370	1.69	1.76	B.
March	21,200	1,240	5,490	3.92	4.52	C.
April	3,260	1,080	1,880	1.34	1.50	B.
May	1,820	638	1,250	.893	1.03	B.
June	3,460	742	1,680	1.20	1.34	B.
July	1,720	470	1,250	.893	1.03	B.
August	2,130	355	1,210	.864	1.00	B.
September	1,920	638	1,170	.836	.93	B.
October	1,240	414	899	.642	.74	C.
November	1,000	327	664	.474	.53	C.
December	1,620	390	1,030	.736	.85	B.
The year	21,200	327	1,750	1.25	16.92	

OCMULGEE RIVER AT MACON, GA.

Location.—At the Fifth Street Bridge in the city of Macon, near the Southern Railway passenger station and about 500 feet above the Central of Georgia Railway bridge.

Records available.—October 18, 1895, to December 31, 1913.

Drainage area.—2,420 square miles.

Gage.—The United States Weather Bureau gage originally used at this station is a heavy timber bolted to a pier of the Central of Georgia Railway bridge. A standard chain gage was installed October 9, 1905, on the downstream steel handrail of highway bridge, about 500 feet upstream from old gage. These gages have been referred to the same datum and have given practically the same readings. Since August 1, 1912, the discharge relation has been considerably changed owing to the construction of a dock about 800 feet below the gage.

Channel and control.—Both banks are high and neither is subject to overflow; bed soft and shifting.

Discharge measurements.—Made from the downstream side of the highway bridge to which the gage is attached.

Regulation.—Flow, especially at low stages, is likely to be considerably affected by the operations of the power dam near Jackson, Ga.

Accuracy.—As the station is situated below the fall line, rapidly rising or falling stages are likely to be attended by variations in surface slope, causing greater or less discharge than for the normal rating curve. The possible error in mean gage heights due to artificial control may cause the estimates for individual days to be considerably in error, especially at low stages. Dredging and construction work below the station has so changed the discharge relation that no estimates can be made for 1913.

Cooperation.—Since June 1, 1899, all gage heights have been furnished by the United States Weather Bureau.

The following discharge measurement was made by B. M. Hall, jr.:

April 3: Gage height, 7.34 feet; discharge 3,200 second-feet.

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Daily gage height, in feet, of Ocmulgee River at Macon, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.0	8.7	15.8	9.3	5.0	4.0	3.7	4.0	1.4	3.4	2.2	0.2
2	4.5	7.4	14.7	8.5	5.5	2.8	3.9	6.8	1.7	2.3	2.0	.3
3	4.7	4.8	10.3	7.8	5.0	4.4	4.4	4.2	2.0	2.9	1.0	1.4
4	4.4	12.9	9.1	7.3	4.4	4.3	4.2	8.7	2.2	2.9	2.0	.1
5	3.8	10.8	7.2	7.1	3.9	4.7	4.5	4.9	5.2	2.4	1.1	1.2
6	2.9	9.2	6.4	6.6	4.8	5.4	4.8	3.8	6.6	1.3	.9	1.3
7	4.4	7.6	5.8	6.2	4.8	5.2	2.9	3.1	3.9	2.5	.9	1.1
8	4.2	6.6	5.1	6.7	4.8	6.1	4.1	3.8	2.0	3.0	.7	2.5
9	4.0	5.5	4.6	6.6	4.7	10.6	3.7	3.8	2.9	2.9	1.7	1.1
10	4.1	4.0	3.7	6.2	4.5	8.5	3.9	3.9	3.0	2.8	.8	.8
11	3.7	5.4	5.4	6.2	4.2	6.5	4.9	4.3	3.0	2.9	1.4	1.8
12	3.5	5.9	6.4	13.2	3.3	6.0	4.3	4.0	3.0	2.4	1.4	2.1
13	2.7	5.9	11.9	9.6	4.5	5.3	4.4	3.8	2.9	1.3	1.3	1.7
14	4.4	6.2	14.3	7.5	4.2	4.8	2.9	4.0	2.4	1.9	1.4	1.8
15	4.3	5.6	19.8	7.3	4.6	4.1	3.8	3.7	1.8	1.6	1.3	1.3
16	4.0	4.9	23.5	6.8	4.5	3.0	3.8	4.0	3.0	1.2	1.1	1.7
17	4.0	3.8	21.7	6.4	4.4	4.7	3.4	3.6	3.1	1.3	.8	1.6
18	3.9	5.2	17.6	6.2	4.0	4.2	3.3	2.7	3.0	.9	2.0	1.8
19	3.3	4.8	13.0	6.4	3.6	4.3	3.3	2.9	4.8	1.0	1.0	2.2
20	2.3	5.2	11.6	5.6	5.0	4.3	3.5	3.0	10.5	1.6	.5	2.0
21	3.8	5.2	10.4	5.1	5.0	4.3	2.6	2.9	5.1	2.3	.5	1.6
22	3.6	5.9	14.9	5.8	5.0	3.9	5.5	3.0	3.6	1.3	.7	1.0
23	3.5	6.2	12.9	5.5	4.7	2.4	8.3	3.0	4.3	.9	.4	1.6
24	3.6	5.0	11.1	5.4	4.8	4.5	9.9	2.5	3.0	2.3	.3	1.1
25	11.8	6.0	10.0	5.0	4.4	4.1	4.9	1.8	3.0	2.7	—.1	.9
26	8.7	5.2	9.2	5.3	4.2	4.0	5.0	2.3	3.1	1.2	.5	1.2
27	7.8	4.9	10.9	4.9	4.8	4.2	5.1	2.8	3.0	.8	.8	.9
28	11.8	9.9	12.2	4.2	4.5	4.8	3.4	2.9	2.6	2.3	.4	.8
29	13.2	.....	11.7	5.3	4.6	3.9	7.1	4.0	1.8	1.7	.8	.6
30	13.0	.....	10.4	5.2	4.0	2.7	6.0	2.5	3.8	1.9	.6	5.6
31	10.5	.....	9.9	.....	4.2	.....	4.8	2.0	.....	2.2	.....	4.1

OCONEE RIVER NEAR GREENSBORO, GA.

Location.—At the highway bridge 5 miles west of Greensboro on the road to Madison, Ga., about 4 miles above the mouth of Apalachee River and 1½ miles below Town Creek.

Records available.—July 25, 1903, to December 31, 1913.

Drainage area.—1,100 square miles.

Gage.—Standard chain gage attached to the bridge.

Channel and control.—Bed composed chiefly of sand; slightly shifting.

Discharge measurements.—Made from the downstream side of the bridge.

Regulation.—Flow affected by operation of power plants above station.

Accuracy.—No discharge measurements made in 1913, but one made in 1914 indicated that there had been no change in discharge relation. Estimates of daily discharge, especially at low stages, may be somewhat in error for individual days because of fluctuations due to operation of power plants.

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Daily gage height, in feet, of Oconee River near Greensboro, Ga., for 1913.

[W. E. Strickland, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	5.2	11.1	5.4	3.3	3.6	2.5	3.4	1.6	5.5	2.4	3.4
2	3.5	4.0	12.4	4.9	3.2	3.4	2.6	3.2	1.6	4.8	2.2	3.4
3	3.1	3.3	9.0	4.8	3.1	5.8	2.4	3.8	1.8	4.0	2.2	2.8
4	2.8	3.5	6.6	4.6	3.1	3.9	2.0	4.0	2.7	3.2	2.1	2.6
5	3.2	4.6	5.5	4.6	3.0	3.5	3.1	2.6	2.3	2.4	1.8	2.5
6	3.2	5.4	5.3	4.4	3.1	4.0	4.2	2.2	3.6	2.2	1.8	2.6
7	2.9	4.8	4.2	4.3	3.2	4.1	2.6	2.6	3.3	2.0	1.8	2.4
8	2.7	4.1	4.2	4.0	3.2	5.0	2.0	6.2	2.6	2.0	2.3	1.9
9	2.6	3.8	4.0	4.0	3.1	9.2	2.1	5.4	1.9	2.0	2.8	2.0
10	3.1	3.6	4.3	3.8	3.2	10.3	1.6	2.7	1.8	2.1	2.6	2.4
11	3.1	3.7	5.2	7.4	3.2	5.8	1.6	3.8	1.6	1.8	2.4	2.4
12	2.9	4.0	8.8	12.2	2.9	4.2	1.8	2.4	3.0	1.8	2.2	2.4
13	2.8	3.8	10.9	9.6	2.4	3.2	2.6	2.4	1.4	1.8	2.0	2.6
14	2.6	3.8	13.8	7.2	2.2	2.6	3.0	2.7	1.3	1.8	1.7	2.8
15	2.6	4.2	18.4	6.4	2.1	2.5	2.6	2.5	1.4	1.8	1.6	2.6
16	2.8	4.0	24.2	5.4	2.2	2.2	2.3	2.7	1.4	1.7	1.7	2.5
17	2.8	3.8	19.2	4.4	2.8	2.1	1.8	2.4	1.6	1.6	1.8	2.5
18	3.0	3.8	15.6	4.2	3.2	2.2	1.6	1.9	3.6	1.9	1.8	2.5
19	2.8	4.4	11.6	4.1	3.8	3.0	2.6	1.8	7.6	2.2	2.0	2.4
20	2.8	4.4	9.0	4.0	4.2	2.6	3.0	1.6	5.8	3.7	2.0	2.2
21	2.6	8.3	9.3	3.8	3.6	2.3	3.6	1.6	4.6	4.6	2.2	2.6
22	2.6	7.9	10.0	3.6	3.2	2.4	4.0	1.6	3.6	3.4	2.1	2.4
23	2.8	7.4	8.2	3.5	3.7	2.4	4.2	1.8	3.2	3.4	1.9	3.0
24	6.5	6.4	5.7	3.4	3.8	3.0	2.6	4.2	2.6	4.6	1.8	3.2
25	13.2	5.4	5.0	3.4	4.0	2.3	2.9	4.9	2.2	5.8	2.0	3.3
26	7.8	4.8	4.6	3.4	3.8	2.2	3.8	3.0	1.8	4.6	2.1	3.8
27	8.1	5.0	10.2	3.6	3.1	2.4	5.4	2.2	1.8	3.2	1.8	3.6
28	12.6	5.1	8.3	3.6	2.8	2.4	4.6	2.0	1.9	2.8	1.6	3.6
29	16.0	.....	8.8	3.4	2.6	2.4	3.6	1.8	2.2	2.7	1.8	5.6
30	14.2	.....	11.5	3.3	2.4	2.6	3.6	1.8	5.8	2.6	2.0	11.2
31	9.2	.....	7.4	.....	2.4	.....	3.8	1.8	.....	2.4	.....	11.6

Daily discharge, in second-feet, of Oconee River near Greensboro, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,160	1,900	5,480	2,000	1,040	1,160	755	1,080	479	2,050	720	1,080
2	1,120	1,330	6,530	1,750	1,000	1,080	790	1,000	479	1,700	650	1,080
3	965	1,040	4,090	1,700	965	2,200	720	1,240	534	1,330	650	860
4	860	1,120	2,630	1,600	965	1,280	590	1,330	825	1,000	620	790
5	1,000	1,600	2,050	1,600	930	1,120	965	790	685	720	534	755
6	1,000	2,000	1,950	1,510	965	1,330	1,420	650	1,160	650	534	790
7	895	1,700	1,420	1,460	1,000	1,380	790	790	1,040	590	534	720
8	825	1,380	1,420	1,330	1,000	1,800	590	2,410	790	590	685	562
9	790	1,240	1,330	1,330	965	4,220	620	2,000	562	590	860	590
10	965	1,160	1,460	1,240	1,000	4,940	479	825	534	620	790	720
11	965	1,200	1,900	3,100	1,000	2,200	479	1,240	479	534	720	720
12	895	1,330	3,960	6,350	895	1,420	534	720	930	534	650	720
13	860	1,240	5,340	4,480	720	1,000	790	720	426	534	590	790
14	790	1,240	7,920	2,980	650	790	930	825	400	534	506	860
15	790	1,420	14,000	2,520	620	755	790	755	426	534	479	790
16	860	1,330	22,600	2,000	650	650	685	825	426	506	506	755
17	860	1,240	15,200	1,510	860	620	534	720	479	479	534	755
18	930	1,240	10,100	1,420	1,000	650	479	562	1,160	562	534	755
19	860	1,510	5,860	1,380	1,240	930	790	534	3,220	650	590	720
20	860	1,510	4,090	1,330	1,420	790	930	479	2,200	1,200	590	650
21	790	3,640	4,280	1,240	1,160	685	1,160	479	1,600	1,600	650	790
22	790	3,400	4,740	1,160	1,000	720	1,330	479	1,160	1,080	620	720
23	860	3,100	3,580	1,120	1,200	720	1,420	534	1,000	1,080	562	930
24	2,580	2,520	2,150	1,080	1,240	930	790	1,420	790	1,600	534	1,000
25	7,300	2,000	1,800	1,080	1,330	685	895	1,750	650	2,200	590	1,040
26	3,340	1,700	1,600	1,080	1,240	650	1,240	930	534	1,600	620	1,240
27	3,520	1,800	4,870	1,160	965	720	2,000	650	534	1,000	534	1,160
28	6,720	1,850	3,640	1,160	860	720	1,600	590	562	860	479	1,160
29	10,600	.....	3,960	1,080	790	720	1,160	534	650	825	534	2,100
30	8,370	.....	5,780	1,040	720	790	1,160	534	2,200	790	590	5,560
31	4,220	.....	3,100	.....	720	.....	1,240	534	.....	720	.....	5,860

NOTE.—Daily discharge determined from a rating curve fairly well defined below 6,000 second-feet. Above 7,000 second-feet the curve is approximate.

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Monthly discharge of Oconee River near Greensboro, Ga., for 1913.

[Drainage area, 1,100 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	10,600	790	2,170	1.97	2.27	B.
February	3,640	1,040	1,700	1.55	1.61	A.
March	22,600	1,330	5,120	4.65	5.36	C.
April	6,350	1,040	1,790	1.63	1.82	A.
May	1,420	620	971	.883	1.02	A.
June	4,940	620	1,260	1.15	1.28	A.
July	2,000	479	924	.840	.97	A.
August	2,410	479	901	.819	.94	A.
September	3,220	400	897	.815	.91	A.
October	2,200	479	944	.858	.99	A.
November	860	479	600	.545	.61	A.
December	5,860	562	1,190	1.08	1.24	A.
The year	22,600	400	1,540	1.40	19.02	

OCONEE RIVER AT FRALEYS FERRY, NEAR MILLEDGEVILLE, GA.

Location.—At Fraleys Ferry, 6 miles above Milledgeville, Ga., and about 4 miles below mouth of Little River.

Records available.—May 23, 1906, to December 31, 1908; October 6, 1909, to December 31, 1913.

Drainage area.—2,840 square miles.

Gage.—A combination sloping and vertical rod gage in four sections. Section 0 to 8 feet is the old sloping gage bolted to solid rock on left bank above Fraley's Ferry. On November 13–14, 1913, vertical sections were added up to 20 feet.

Channel and control.—Sandy and shifting at measuring section; rock control below.

Discharge measurements.—Made from ferryboat.

Point of zero flow.—Top of natural control is approximately 3 feet above zero of gage. The point of zero flow is therefore at about gage height 3 feet.

Regulation.—None below vicinity of Athens, Ga., where storage may cause low daily discharge at this station at times.

Accuracy.—Records excellent, except for high discharges, which can not be measured.

The following discharge measurement was made by Warren E. Hall and B. M. Hall, jr.

November 14: Gage height, 5.39 feet; discharge, 1,370 second-feet.

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Daily gage height, in feet, of Oconee River at Fraleys Ferry, near Milledgeville, Ga., for 1913.
[H. A. Taylor, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	7.1	11.2	7.5	6.1	6.0	5.8	6.2	5.2	7.9	5.6	5.4
2	6.4	7.1	13.6	7.2	6.0	6.1	5.9	6.5	5.15	7.5	5.4	5.8
3	6.2	7.8	11.1	7.0	6.0	6.6	5.8	6.4	5.1	6.6	5.45	5.9
4	6.2	8.7	8.0	6.8	6.0	6.7	5.7	7.2	5.0	5.8	5.5	5.8
5	6.2	8.2	7.8	6.8	6.0	6.5	6.3	7.0	5.1	5.5	5.6	5.6
6	6.1	7.9	7.4	6.7	5.9	6.6	6.6	5.6	6.4	5.4	5.6	5.45
7	6.1	7.5	7.0	6.6	5.9	6.8	5.9	5.45	6.8	5.35	5.4	5.5
8	6.1	7.0	6.8	6.5	5.9	7.4	5.4	5.3	6.1	5.25	5.5	6.0
9	6.0	6.5	6.7	6.5	5.9	8.4	5.2	6.8	5.6	5.3	6.3	6.1
10	6.0	6.4	6.8	6.5	5.8	9.2	5.3	5.9	5.4	5.2	5.4	5.8
11	6.0	6.4	7.3	7.2	5.8	8.3	5.7	6.8	5.15	5.15	5.6	5.6
12	6.0	7.2	7.8	12.6	5.8	7.4	5.7	7.0	5.05	5.1	5.45	5.5
13	6.0	7.9	12.0	12.6	5.8	6.7	5.8	6.0	5.0	5.45	5.4	5.4
14	6.1	7.8	14.6	8.0	5.8	6.2	6.0	6.0	4.95	5.25	5.4	5.4
15	6.1	7.2	16.0	7.8	5.8	6.0	6.0	6.6	4.85	5.1	5.3	5.5
16	6.0	6.8	20.0	7.5	5.8	5.9	5.8	6.2	4.95	5.05	5.35	5.5
17	5.9	6.6	24.6	7.1	5.8	5.8	5.45	5.7	5.1	5.05	5.4	5.5
18	5.9	6.4	19.0	6.8	6.3	5.7	5.3	5.35	5.45	5.05	5.5	5.5
19	5.9	6.4	14.0	6.6	6.6	5.7	5.15	5.25	8.3	5.1	5.4	5.45
20	5.9	6.6	8.8	6.5	6.8	6.0	5.1	5.15	8.8	6.2	5.4	5.45
21	5.9	7.6	9.2	6.4	6.4	5.9	5.9	5.1	6.8	6.8	5.4	5.5
22	5.8	7.9	9.0	6.4	6.2	5.7	6.4	5.1	6.8	6.2	5.4	5.4
23	5.8	7.6	8.8	6.3	6.0	5.6	6.3	5.1	6.3	5.7	5.35	5.5
24	6.2	6.3	8.3	6.3	6.2	5.6	6.7	5.7	5.8	7.0	5.4	5.7
25	10 8	6.4	7.6	6.3	6.2	5.5	5.8	6.8	5.6	8.5	5.45	6.0
26	9.6	6.6	7.4	6.3	6.2	5.6	6.4	6.2	5.4	7.0	5.45	7.0
27	8.4	6.7	8.6	6.3	6.1	5.5	6.9	5.7	5.4	6.2	5.3	6.5
28	9.6	8.9	9.0	6.3	6.0	5.45	7.1	5.7	5.3	5.8	5.4	6.2
29	9.6	.....	9.0	6.3	5.8	5.4	7.2	5.1	5.2	5.7	5.4	6.2
30	9.6	.....	8.7	6.2	5.8	5.4	5.7	5.1	6.4	5.7	5.4	8.7
31	8.5	.....	8.0	.....	5.9	.....	5.8	5.1	.....	5.6	.....	8.8

Daily discharge, in second-feet, of Oconee River at Fraleys Ferry, near Milledgeville, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,760	3,950	12,500	4,690	2,300	2,150	1,870	2,450	1,170	5,450	1,610	1,380
2	2,760	3,950	18,900	4,130	2,150	2,300	2,010	2,920	1,120	4,600	1,380	1,870
3	2,450	5,260	12,300	3,770	2,150	3,080	1,870	2,760	1,080	3,080	1,440	2,010
4	2,450	7,050	5,650	3,420	2,150	3,220	1,740	4,130	990	1,870	1,490	1,870
5	2,450	6,050	5,260	3,420	2,150	2,920	2,600	3,770	1,080	1,490	1,610	1,610
6	2,300	5,450	4,500	3,250	2,010	3,080	3,080	1,610	2,760	1,380	1,610	1,440
7	2,300	4,690	3,770	3,080	2,010	3,420	2,010	1,440	3,420	1,320	1,380	1,490
8	2,300	3,770	3,420	2,920	2,010	4,500	1,380	1,270	2,300	1,220	1,490	2,150
9	2,150	2,920	3,250	2,920	2,010	6,450	1,170	3,420	1,610	1,270	2,600	2,300
10	2,150	2,760	3,420	2,920	1,870	8,070	1,270	2,010	1,380	1,170	1,380	1,870
11	2,150	2,760	4,310	4,130	1,870	6,250	1,740	3,420	1,120	1,120	1,610	1,610
12	2,150	4,130	5,260	16,100	1,870	4,500	1,740	3,770	1,040	1,080	1,440	1,490
13	2,150	5,450	14,500	16,100	1,870	3,250	1,870	2,150	990	1,440	1,380	1,380
14	2,300	5,260	21,700	5,650	1,870	2,450	2,150	2,150	950	1,220	1,380	1,380
15	2,300	4,130	25,600	5,260	1,870	2,150	2,150	3,080	870	1,080	1,270	1,490
16	2,150	3,420	36,800	4,690	1,870	2,010	1,870	2,450	950	1,040	1,320	1,490
17	2,010	3,080	49,700	3,950	1,870	1,870	1,440	1,740	1,080	1,040	1,380	1,490
18	2,010	2,760	34,000	3,420	2,600	1,740	1,270	1,320	1,440	1,040	1,490	1,490
19	2,010	2,760	20,000	3,080	3,080	1,740	1,120	1,220	6,250	1,080	1,380	1,440
20	2,010	3,080	7,250	2,920	3,420	2,150	1,080	1,120	7,250	2,450	1,380	1,440
21	2,010	4,880	8,070	2,760	2,760	2,010	2,010	1,080	3,420	3,420	1,380	1,490
22	1,870	5,450	7,650	2,760	2,450	1,740	2,760	1,080	3,420	2,450	1,380	1,380
23	1,870	4,880	7,250	2,600	2,150	1,610	2,600	1,080	2,600	1,740	1,320	1,490
24	2,450	2,600	6,250	2,600	2,450	1,610	3,250	1,740	1,870	3,770	1,380	1,740
25	11,600	2,760	4,880	2,600	2,450	1,490	1,870	3,420	1,610	6,650	1,440	2,150
26	8,910	3,080	4,500	2,600	2,450	1,610	2,760	2,450	1,380	3,770	1,440	3,770
27	6,450	3,250	6,850	2,600	2,300	1,490	3,590	1,740	1,380	2,450	1,270	2,920
28	8,910	7,450	7,650	2,600	2,150	1,440	3,950	1,740	1,270	1,870	1,380	2,450
29	8,910	.....	7,650	2,600	1,870	1,380	4,130	1,080	1,170	1,740	1,380	2,450
30	8,910	.....	7,050	2,450	1,870	1,380	1,740	1,080	2,760	1,740	1,380	7,050
31	6,650	.....	5,650	.....	2,010	.....	1,870	1,080	.....	1,610	.....	7,250

NOTE.—Daily discharge determined from a rating curve fairly well defined below 6,000 second-feet. Above 7,000 second-feet the curve is approximate.

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Monthly discharge of Oconee River at Fraleys Ferry, near Milledgeville, Ga., for 1913.

[Drainage area, 2,840 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	11,600	1,870	3,670	1.29	1.49	B.
February	7,450	2,600	4,180	1.47	1.53	A.
March	49,700	3,250	11,800	4.15	4.78	C.
April	16,100	2,450	4,200	1.48	1.65	B.
May	3,420	1,870	2,190	.771	.89	A.
June	8,070	1,380	2,770	.975	1.09	A.
July	4,130	1,080	2,130	.750	.86	A.
August	4,130	1,080	2,120	.746	.86	A.
September	7,250	870	1,900	.701	.78	A.
October	6,650	1,040	2,150	.757	.87	A.
November	2,600	1,270	1,460	.514	.57	A.
December	7,250	1,380	2,160	.761	.88	A.
The year	49,700	870	3,400	1.20	16.25	

OCONEE RIVER AT DUBLIN, GA.

Location.—At the Wrightville & Tennille Railroad bridge at Dublin, Ga.

Records available.—February 11, 1898, to December 31, 1913; fragmentary records prior to 1898.

Drainage area.—4,180 square miles.

Gage.—Vertical timber attached to downstream side of central or turnspan-pier of railroad bridge; also a short sloping section bolted to rock just above the bridge on the right bank.

Channel and control.—Rocky and nearly permanent at wagon bridge, shifting in bottom of channel below bridge. At a stage of about 20 feet the left bank overflows for 1,100 feet through an iron frame trestle approach to the bridge. This ground is thickly covered with brushy growth, which probably retards the flow of water over the overflow section. The right bank does not overflow.

Discharge measurements.—Made from downstream side of wagon bridge, 500 feet above railroad bridge.

Regulation.—The only power plant of consequence is near Athens, Ga., and is so far above the station that its operation probably does not greatly affect the flow at Dublin.

Accuracy.—Lack of data covering changes in channel makes results at this station uncertain. A good degree of accuracy may be obtained by making frequent discharge measurements.

Cooperation.—Gage-height records since 1898 furnished by United States Weather Bureau.

Estimates of discharge for 1913 withheld.

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Daily gage height, in feet, of Oconee River at Dublin, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.2	10.8	6.9	11.9	2.8	0.8	0.3	4.1	−0.2	1.8	0.8	6.1
2	4.7	10.7	9.2	11.7	2.7	1.0	.3	3.1	− .1	2.8	.7	6.8
3	4.3	10.8	12.2	10.5	2.6	1.4	.7	3.9	− .3	5.4	.6	5.8
4	4.2	8.9	17.6	8.2	2.1	2.1	.4	3.7	− .5	4.1	.4	4.8
5	4.2	7.4	19.5	6.5	1.9	3.2	.4	4.9	− .5	1.9	.1	6.1
6	4.3	7.9	17.5	4.9	1.9	3.3	1.1	5.5	− .3	1.2	.0	7.8
7	4.0	9.2	15.2	4.9	1.8	3.0	2.2	3.8	.0	.1	− .1	6.9
8	5.3	9.5	12.0	5.0	1.7	2.9	2.8	2.9	2.2	.1	− .2	4.8
9	2.9	8.0	9.9	4.7	1.6	5.0	1.5	.9	2.5	.0	.0	3.7
10	2.8	5.5	5.8	4.4	1.6	5.8	.4	.7	1.1	− .1	1.7	2.5
11	2.8	3.4	4.9	4.2	2.3	6.9	.1	3.2	.4	− .2	2.7	2.6
12	2.8	3.9	4.8	4.0	2.7	7.9	.8	2.8	.1	− .3	3.0	1.9
13	2.9	5.9	6.2	7.2	2.6	8.5	.5	5.1	− .5	− .4	1.7	1.9
14	2.8	6.1	9.0	8.6	1.7	8.1	.4	3.7	− .4	− .6	.8	1.7
15	2.8	7.1	10.9	8.9	1.5	6.2	.8	1.7	− .5	− .5	.7	1.3
16	2.8	7.3	14.2	12.5	1.3	3.2	1.2	2.5	− .6	− .6	.4	1.3
17	2.7	5.5	21.3	12.2	1.3	2.4	.9	3.1	− .6	− .7	.1	1.1
18	2.7	5.0	26.5	9.2	1.2	2.7	.4	1.7	− .1	− .7	− .1	.9
19	2.5	4.0	26.5	5.9	1.2	1.9	.1	.5	− .2	− .6	− .3	.8
20	2.3	3.7	24.0	3.8	2.1	1.1	.0	.1	2.1	− .4	− .3	.8
21	2.2	3.3	23.0	3.8	2.5	1.0	− .1	− .2	5.8	.0	− .3	.8
22	2.1	4.2	20.2	3.7	2.7	1.4	− .2	− .4	6.2	2.1	− .3	1.0
23	2.0	6.0	18.0	3.6	2.5	1.4	.8	− .5	3.9	2.5	− .1	1.2
24	2.0	6.7	14.0	3.3	1.9	.8	2.2	− .5	2.4	1.4	.1	1.8
25	2.0	7.2	14.1	3.2	1.9	.7	3.0	− .3	2.1	2.1	.1	2.1
26	3.5	5.8	14.5	2.9	2.5	.9	3.8	1.0	1.3	5.0	.1	2.4
27	7.2	4.5	13.4	3.0	2.1	.9	4.2	2.5	.3	5.8	.1	2.7
28	8.2	4.8	12.2	3.0	1.5	.4	3.2	1.7	− .1	3.8	.0	2.7
29	9.1	.....	10.5	2.9	1.2	.3	4.1	2.0	− .2	1.7	.0	2.2
30	10.2	.....	10.2	2.9	1.0	.4	6.2	1.1	.1	1.8	− .1	1.8
31	10.6	.....	11.4	.....	.8	.....	6.0	.2	.....	1.1	.....	1.7

FLORIDA EVERGLADES DRAINAGE CANALS.

During the summer of 1913 investigations of flow in the drainage canals of the Florida Everglades were made by the Florida Everglades Engineering Commission. In the course of the investigation engineers of the Commission made frequent measurements of Hillsboro canal, North New River canal, South New River canal, Miami canal, and Threemile canal, at points shown on the map (Pl. III). The results of these measurements as furnished by the Commission are as follows:

Discharge measurements of Hillsboro canal at inlet, near Ritta, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 30	435	Aug. 12	393	Sept. 4	417
June 22	393	20	366	9	413
July 9	432	26	385	10	418
21	438	28	398	18	374
Aug. 1	437	30	419	19	351
4	371	Sept. 3	326	23	404
7	355				

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Discharge measurements of North New River canal at inlet, near Ritta, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 29	534	July 31	480	Aug. 26	516
June 10	494	Aug. 4	406	Sept. 1	444
20	478	9	498	4	469
July 8	501	20	545	13	613
11	526	20	416	19	510
21	498	20	425		

Discharge measurements of North New River canal at dredge boat Everglades, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
July 30	553	Aug. 16	512	Sept. 1	544
31	532	21	561	7	553
Aug. 4	511	22	553	13	571
8	535	22	565	20	549
13	529	Sept. 1	530	22	555

Discharge measurements of North New River canal at lock, near Fort Lauderdale, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 28	1,100	July 17	864	Aug. 28	941
June 9	1,140	29	765	Sept. 10	879
19	2,000	Aug. 2	805	15	968
July 6	1,060	7	1,060	18	1,010
7	1,050	13	830	20	974
12	983	21	946	26	1,000
12	985	22	937		
16	909	22	1,010		

Discharge measurements of South New River canal at Ritta, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
June 1	390	Aug. 12	298	Aug. 28	339
20	336	18	369	30	343
July 19	354	18	296	Sept. 2	294
Aug. 1	297	23	239	15	342
6	316	23	314	27	271
6	285	26	438	29	271
11	335	26	310		

Discharge measurements of South New River canal at Zona, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 27	459	July 16	490	Aug. 29	449
June 8	378	29	358	Sept. 3	376
18	668	Aug. 2	400	9	431
23	659	8	490	10	444
July 5	571	21	403	20	478
12	475	21	371		

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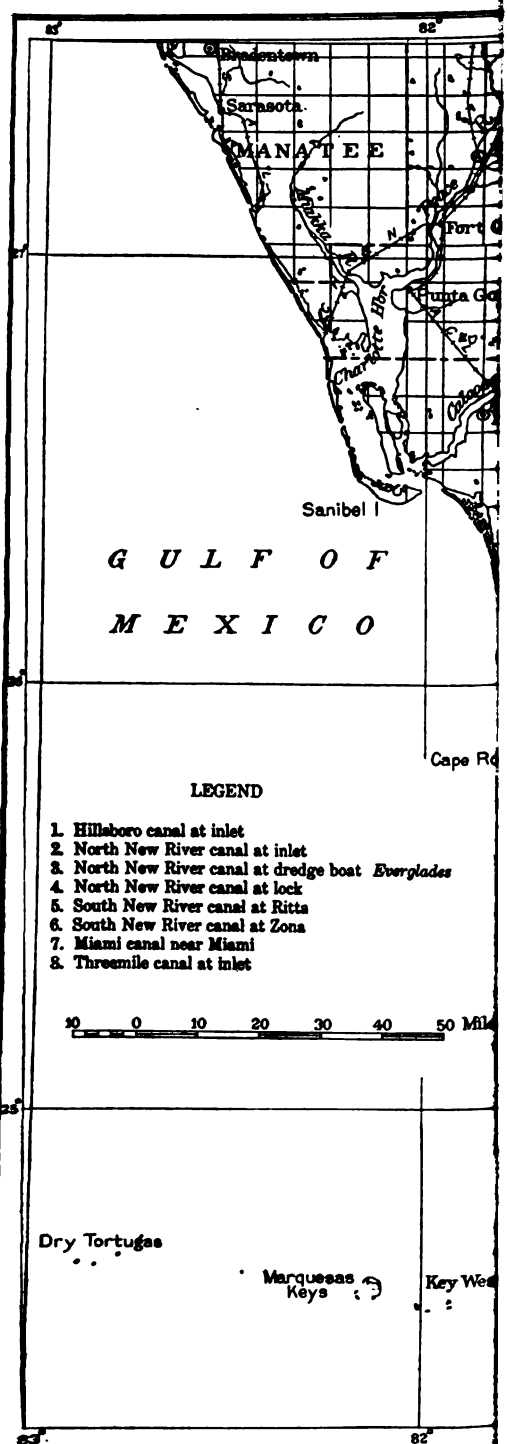
U. S. GEOLOGICAL SURVEY



MAP OF CANALS IN FLORIDA EVER

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Discharge measurements of Miami canal near Miami, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 22	327	July 14	443	Sept. 8	382
25	409	24	380	12	398
June 4	414	31	381	17	428
5	439	Aug. 6	353	22	415
27	478	12	360	29	402
28	426	19	444		
July 1	416	27	409		

Discharge measurements of Threemile canal at inlet, near Ritta, Fla., in 1913.

Date.	Discharge.	Date.	Discharge.	Date.	Discharge.
	Sec.-ft.		*Sec.-ft.*		*Sec.-ft.*
May 30	645	Aug. 18	639	Sept. 3	415
June 20	662	19	525	8	473
July 10	612	23	397	9	462
19	536	25	448	15	495
20	587	29	401	16	468
Aug. 2	558	Sept. 2	507		
11	633	2	475		

APALACHICOLA RIVER BASIN.

CHATTAHOOCHEE RIVER NEAR NORCROSS, GA.

Location.—At Medlock's bridge, 4½ miles north of Norcross, Ga., 1½ miles above the mouth of John Creek, and about 5 miles above Suwanee Creek.

Records available.—January 9, 1903, to December 31, 1913.

Drainage area.—1,170 square miles.

Gage.—Standard chain gage on the toll bridge read twice daily. Original gage was a vertical staff attached to oak tree on right bank about 100 feet above bridge. A chain gage, established March 14, 1903, was read in connection with the vertical gage until June 28, 1905, when present gage was installed.

Channel and control.—Bed of stream sandy and changeable; right bank is high and overflows only slightly; the left bank will overflow for about 800 feet at a gage height of 16 to 18 feet.

Discharge measurements.—Made from downstream side of bridge.

Regulation.—Dams near Gainesville, Ga., and on Chestatee River interfere with the natural flow. It is thought that the two readings a day give a good daily mean gage height.

Accuracy.—Except for possible error in mean gage heights due to artificial control, the results at this station are excellent.

Cooperation.—Since September 1, 1912, morning gage heights have been furnished by United States Weather Bureau.

Discharge measurements of Chattahoochee River near Norcross, Ga., in 1913.

[Warren E. Hall, hydrographer.]

Date	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Mar. 13	7.61	7,190	Mar. 14	11.54	13,200
13	7.80	7,710	15	12.79	14,300
14	11.19	12,900			

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Daily gage height, in feet, of Chattahoochee River near Norcross, Ga., for 1913.

[W. O. Medlock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	3.9	6.3	4.9	3.2	2.9	2.7	2.6	2.0	3.6	2.0	1.9
2	2.8	3.6	4.7	4.6	3.2	3.0	2.5	3.5	1.8	2.4	1.75	2.7
3	2.8	4.1	4.2	4.4	3.1	3.2	1.9	2.8	1.9	2.0	1.7	2.7
4	2.7	5.8	3.9	4.4	3.1	3.0	2.2	2.3	1.7	2.1	1.9	2.4
5	2.5	4.6	3.8	4.1	2.9	2.9	2.4	2.4	1.9	1.9	1.8	2.0
6	2.6	3.8	3.5	4.1	3.0	2.9	2.6	3.9	2.1	1.7	1.8	2.0
7	2.6	3.6	3.6	4.0	3.0	3.0	2.2	2.8	2.5	2.1	1.85	2.4
8	2.6	3.4	3.3	4.0	3.1	3.9	2.4	2.3	1.9	1.7	1.7	2.7
9	2.8	3.2	3.4	3.8	3.0	4.6	1.9	2.7	2.0	1.8	2.0	2.7
10	2.6	3.2	6.0	3.8	3.0	3.3	1.95	3.0	1.8	1.85	2.1	1.9
11	2.7	4.2	6.7	4.2	3.1	3.2	2.2	2.7	1.8	1.9	2.2	2.2
12	3.0	7.4	5.4	4.5	2.9	3.0	2.4	2.9	1.75	1.6	1.7	2.0
13	3.3	4.9	7.1	4.5	3.0	2.8	2.9	2.7	1.7	1.4	1.9	1.9
14	3.1	4.0	11.2	4.0	3.0	2.8	2.3	2.7	1.65	1.7	1.8	2.0
15	2.8	3.7	12.9	4.1	2.8	2.6	2.3	2.8	1.55	1.6	1.9	1.9
16	2.8	3.4	12.3	4.0	3.0	2.3	2.1	2.7	1.9	2.0	1.7	1.9
17	2.7	3.4	7.4	3.8	3.1	2.4	2.2	2.4	2.2	1.75	1.9	2.0
18	2.7	3.2	6.0	3.7	3.1	2.6	2.1	2.0	2.0	1.75	1.8	1.9
19	2.9	3.1	5.4	3.6	3.0	2.9	1.9	2.1	2.2	1.9	2.0	1.85
20	2.7	3.4	5.1	3.6	2.9	2.3	1.9	1.9	1.9	2.4	1.7	1.8
21	2.8	4.8	5.6	3.6	3.0	2.5	2.2	1.95	2.2	2.8	1.8	1.9
22	2.8	4.2	6.3	3.5	2.9	2.7	2.6	1.9	1.9	2.0	1.65	1.8
23	2.8	3.7	5.0	3.4	3.7	2.4	2.3	2.2	2.0	1.75	1.7	1.85
24	3.6	3.6	4.7	3.4	5.8	2.6	2.0	2.9	1.9	2.2	1.7	2.1
25	5.7	3.4	4.6	3.3	4.0	2.5	2.4	2.1	1.85	2.3	1.75	2.3
26	4.5	3.2	4.6	3.4	3.3	2.4	4.3	1.9	1.7	2.3	1.8	2.5
27	10.7	3.9	9.5	3.4	3.1	2.4	3.4	1.85	1.8	2.1	1.8	2.2
28	9.8	9.8	9.8	3.4	3.0	2.6	3.3	1.8	1.6	2.0	1.5	2.5
29	5.4	.....	6.2	3.4	3.0	2.4	3.0	1.8	1.5	2.0	1.65	2.9
30	4.1	.....	5.4	3.3	2.8	2.5	2.8	2.7	5.5	2.0	1.9	3.9
31	3.9	.....	5.4	.....	2.8	.....	3.2	2.9	.....	2.1	.....	3.6

Daily discharge, in second-feet, of Chattahoochee River near Norcross, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,800	2,610	5,340	3,640	1,980	1,720	1,560	1,480	1,000	2,340	1,000	925
2	1,640	2,340	3,420	3,310	1,980	1,800	1,400	2,250	850	1,320	812	1,560
3	1,640	2,800	2,900	3,100	1,890	1,980	925	1,640	925	1,000	775	1,560
4	1,560	4,710	2,610	3,100	1,890	1,800	1,160	1,240	775	1,080	925	1,330
5	1,400	3,310	2,520	2,800	1,720	1,720	1,320	1,320	925	925	850	1,000
6	1,480	2,520	2,250	2,800	1,800	1,720	1,480	2,610	1,080	775	850	1,080
7	1,480	2,340	2,340	2,700	1,800	1,800	1,160	1,640	1,400	1,080	888	1,230
8	1,480	2,160	2,070	2,700	1,890	2,610	1,320	1,240	925	775	775	1,560
9	1,640	1,980	2,160	2,520	1,800	3,310	925	1,560	1,000	850	1,000	1,560
10	1,480	1,980	4,950	2,520	1,800	2,070	962	1,800	850	888	1,080	925
11	1,560	2,900	5,860	2,900	1,890	1,980	1,160	1,560	850	925	1,160	1,160
12	1,800	6,810	4,230	3,200	1,720	1,800	1,320	1,720	812	700	775	1,080
13	2,070	3,640	6,390	3,200	1,800	1,640	1,720	1,560	775	560	925	925
14	1,890	2,700	12,400	2,700	1,800	1,640	1,240	1,560	738	775	850	1,080
15	1,640	2,430	15,100	2,800	1,640	1,480	1,240	1,640	665	630	925	925
16	1,640	2,160	14,200	2,700	1,800	1,240	1,080	1,560	925	1,080	775	925
17	1,560	2,160	6,810	2,520	1,890	1,320	1,160	1,320	1,160	812	925	1,080
18	1,560	1,980	4,950	2,430	1,890	1,480	1,080	1,080	1,080	812	850	925
19	1,720	1,890	4,230	2,340	1,800	1,720	925	1,080	1,160	925	1,080	888
20	1,560	2,160	3,870	2,340	1,720	1,240	925	925	925	1,320	775	850
21	1,640	3,530	4,470	2,340	1,800	1,400	1,160	962	1,160	1,640	850	925
22	1,640	2,900	5,340	2,250	1,720	1,560	1,480	925	925	1,080	738	850
23	1,640	2,430	3,750	2,160	2,430	1,320	1,240	1,160	1,080	812	775	888
24	2,340	2,340	3,420	2,160	4,710	1,480	1,080	1,720	925	1,160	775	1,080
25	4,590	2,160	3,310	2,070	2,700	1,400	1,320	1,080	888	1,240	812	1,240
26	3,200	1,980	3,310	2,160	2,070	1,320	3,000	925	775	1,240	850	1,400
27	11,600	2,610	9,850	2,160	1,890	1,320	2,160	888	850	1,080	850	1,080
28	10,300	10,300	10,300	2,160	1,800	1,480	2,070	850	700	1,000	630	1,400
29	4,230	.....	5,210	2,160	1,800	1,320	1,800	850	630	1,000	738	1,720
30	2,800	.....	4,230	2,070	1,640	1,400	1,640	1,560	4,350	1,000	925	2,610
31	2,610	.....	4,230	.....	1,640	.....	1,980	1,720	.....	1,080	.....	2,340

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge for individual days may be somewhat in error because of fluctuations due to operation of power plants.

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Monthly discharge of Chattahoochee River near Norcross, Ga., for 1913.

[Drainage area, 1,170 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	11,600	1,400	2,550	2.18	2.51	B.
February	10,300	1,890	2,990	2.56	2.67	B.
March	15,100	2,070	5,360	4.58	5.28	B.
April	3,640	2,070	2,600	2.22	2.48	B.
May	4,710	1,640	1,960	1.68	1.94	B.
June	3,310	1,240	1,670	1.43	1.60	B.
July	3,000	925	1,380	1.18	1.36	B.
August	2,610	850	1,400	1.20	1.38	B.
September	4,350	630	1,030	.880	.98	B.
October	2,340	560	1,020	.872	1.01	B.
November	1,160	630	862	.737	.82	B.
December	2,610	850	1,250	1.07	1.23	B.
The year	15,100	560	2,000	1.71	23.26	

CHATTAHOOCHEE RIVER AT WEST POINT, GA.

Location.—At Montgomery Street Bridge, West Point, Ga., until October 20, 1912; after that date at a point about a mile upstream, just below the mouth of Oseligee Creek, about 300 feet east of the West Point waterworks pumping plant, and about 4 miles above Long Cane Creek.

Records available.—July 30, 1896, to December 31, 1913.

Drainage area.—3,300 square miles.

Gage.—Staff gage in two sections; the lower section, reading from 0 to 6 feet, is near the right bank; the upper section, reading from 6 to 25 feet, is fastened to a tree on the left bank; datum of staff gage different from that of chain gage formerly used.

Channel and control.—Bottom rough, rocky, and fairly permanent; banks are overflowed at high stages; control, a rock ledge extending entirely across river just below gage.

Discharge measurements.—Made from a boat at a section near staff gage, or from highway bridge to which chain gage was attached; no tributaries enter between the two sections.

Regulation.—The operation of power plants at points above causes some diurnal fluctuation. The Langdale Dam, 5 miles below the station, forms a pond reaching back as far as West Point. This affected the gage heights at the highway bridge. The new gage established in October, 1912, is not affected by backwater.

Accuracy.—Rating curve well developed from low to medium flood stages. No records of discharge at extreme floods have yet been obtained. Diurnal fluctuation caused by hydroelectric plants above will cause some error in individual days, during low water.

Cooperation.—Gage heights after October 20, 1912, have been furnished by the Columbus Power Co., of Columbus, Ga. The hydraulic engineer for that company has also assisted in making discharge measurements.

Discharge measurements of Chattahoochee River at West Point, Ga., in 1913.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec. ft.*			*Feet.*	*Sec. ft.*
Feb. 12	Hall and King	4.29	5,470	Feb. 12	Warren E. Hall	4.37	5,890
12	do	4.38	5,390	13	Hall and King	6.73	11,400
12	do	4.34	5,500	13	Warren E. Hall	6.61	11,100

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Daily gage height, in feet, of Chattahoochee River at West Point, Ga., for 1913.
[J. H. Miller, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	6.1	7.6	6.1	3.8	3.3	4.2	3.6	2.6	3.9	2.6	2.6
2	3.8	5.4	8.4	5.7	3.8	3.6	3.6	5.4	2.5	4.5	2.6	3.2
3	3.7	6.8	5.9	5.3	3.7	4.7	3.2	4.9	3.1	3.6	2.7	3.4
4	3.9	9.2	5.1	5.1	3.6	4.0	3.0	3.8	2.4	2.9	2.4	3.2
5	3.6	7.9	4.7	5.0	3.7	3.8	3.2	3.4	2.3	2.7	2.4	3.3
6	3.7	6.2	4.5	4.8	3.6	4.2	2.9	2.8	2.2	2.4	2.4	3.8
7	3.4	5.2	4.3	4.6	3.6	4.8	2.7	2.8	2.2	2.4	2.4	3.2
8	3.5	4.7	4.1	4.6	3.7	5.0	3.0	4.4	2.2	2.4	2.5	3.5
9	3.6	4.3	4.0	4.5	3.6	5.0	2.7	3.8	2.2	2.2	2.5	3.0
10	3.6	4.1	5.7	4.4	3.7	4.5	2.7	3.4	2.6	2.4	2.4	2.9
11	3.5	4.1	8.2	5.2	3.7	4.3	2.9	3.2	2.3	2.2	2.4	3.0
12	3.9	4.3	7.4	4.9	3.6	3.8	3.3	3.1	2.8	2.1	2.6	2.8
13	4.4	6.7	11.4	4.8	3.4	3.6	3.9	3.1	2.3	2.0	2.5	2.8
14	4.1	6.2	.....	4.7	3.5	3.4	4.6	3.2	2.2	2.0	2.5	2.7
15	3.8	5.0	.....	4.6	3.6	3.3	4.2	3.3	2.1	2.1	2.4	2.6
16	3.7	4.4	.....	4.4	3.4	3.2	3.4	3.4	2.4	2.1	2.5	2.9
17	3.7	4.1	.....	4.4	3.7	3.0	3.4	3.2	2.3	1.95	2.4	2.6
18	3.6	4.1	11.4	4.3	4.0	3.0	3.1	3.2	2.2	2.1	2.5	2.6
19	3.7	3.9	7.2	4.2	3.8	3.0	2.8	3.9	2.5	2.9	2.4	2.6
20	3.6	5.2	6.4	4.2	3.7	3.0	3.6	2.5	2.6	3.8	2.4	2.6
21	3.6	5.3	7.4	4.1	3.8	3.2	3.8	2.4	3.2	3.6	2.4	2.6
22	3.7	5.7	10.2	4.0	3.6	3.2	3.4	2.3	3.0	3.0	2.6	2.6
23	3.6	5.6	7.8	4.0	3.9	3.2	3.7	2.3	2.8	3.1	2.4	2.7
24	3.9	4.8	6.5	3.9	5.2	3.5	4.0	3.0	2.2	3.8	2.5	2.7
25	6.8	4.4	5.8	3.9	4.7	3.1	3.5	3.2	2.6	3.9	2.3	3.0
26	6.3	4.1	5.4	3.9	5.1	3.0	3.7	3.0	2.2	3.2	2.4	3.1
27	.....	5.3	9.4	4.0	4.0	3.0	4.4	2.5	2.3	2.8	2.4	3.4
28	.....	7.1	10.1	3.8	3.7	2.9	4.8	2.3	2.2	2.2	2.4	3.3
29	.....	.....	9.7	3.9	3.6	2.9	4.4	2.4	2.2	2.7	2.4	3.8
30	10.8	.....	8.4	3.8	3.4	4.2	4.8	3.2	4.0	2.6	2.5	5.0
31	6.1	.....	6.9	.....	3.4	.....	4.0	2.6	.....	2.7	.....	5.0

NOTE.—Water over top of gage Jan. 27–29 and Mar. 14–17.

Daily discharge, in second-feet, of Chattahoochee River at West Point, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,150	9,750	13,500	9,760	4,150	3,160	5,080	3,730	2,130	4,370	2,130	2,130
2	4,150	8,000	15,500	8,750	4,150	3,730	3,730	8,000	2,000	5,800	2,130	2,980
3	3,940	11,500	9,250	7,750	3,940	6,280	2,990	6,760	2,830	3,730	2,260	3,340
4	4,370	17,500	7,250	7,250	3,730	4,600	2,680	4,150	1,880	2,540	1,880	2,980
5	3,730	14,200	6,280	7,000	3,940	4,150	2,990	3,340	1,770	2,260	1,880	3,160
6	3,940	10,000	5,800	6,520	3,730	5,080	2,540	2,400	1,660	1,880	1,880	4,150
7	3,340	7,500	5,320	6,040	3,730	6,520	2,260	2,400	1,660	1,880	1,880	2,980
8	3,530	6,280	4,840	6,040	3,940	7,000	2,680	5,560	1,660	1,880	2,000	3,530
9	3,730	5,320	4,600	5,800	3,730	7,000	2,260	4,150	1,660	1,660	2,000	2,660
10	3,730	4,840	8,750	5,560	3,940	5,800	2,260	3,340	2,130	1,880	1,880	2,540
11	3,530	4,840	15,000	7,500	3,940	5,320	2,540	2,990	1,770	1,660	1,880	2,660
12	4,370	5,320	13,000	6,760	3,730	4,150	3,160	2,830	2,400	1,560	2,130	2,400
13	5,560	11,200	23,000	6,520	3,340	3,730	4,370	2,830	1,770	1,460	2,000	2,400
14	4,840	10,000	35,000	6,280	3,530	3,340	6,040	2,990	1,660	1,460	2,000	2,260
15	4,150	7,000	45,000	6,040	3,730	3,160	5,080	3,160	1,560	1,560	1,880	2,130
16	3,940	5,560	40,000	5,560	3,340	2,990	3,340	3,340	1,880	1,560	2,000	2,540
17	3,940	4,840	33,000	5,560	3,940	2,680	3,340	2,990	1,770	1,420	1,880	2,130
18	3,730	4,840	23,000	5,320	4,600	2,680	2,830	2,990	1,660	1,560	2,000	2,130
19	3,940	4,370	12,500	5,080	4,150	2,680	2,400	4,370	2,000	2,540	1,880	2,130
20	3,730	7,500	10,500	5,080	3,940	2,680	3,730	2,000	2,130	4,150	1,880	2,130
21	3,730	7,750	13,000	4,840	4,150	2,990	4,150	1,880	2,990	3,730	1,880	2,130
22	3,940	8,750	20,000	4,600	3,730	2,990	3,340	1,770	2,680	2,680	2,130	2,130
23	3,730	8,500	14,000	4,600	4,370	2,990	3,940	1,770	2,400	2,830	1,880	2,260
24	4,370	6,520	10,800	4,370	7,500	3,530	4,600	2,680	1,660	4,150	2,000	2,260
25	11,500	5,560	9,000	4,370	6,280	2,830	3,530	2,990	2,130	4,370	1,770	2,660
26	10,200	4,840	8,000	4,370	7,250	2,680	3,940	2,680	1,660	2,990	1,880	2,830
27	26,000	7,750	18,200	4,600	4,600	2,680	5,560	2,000	1,770	2,400	1,880	3,340
28	35,000	12,200	19,800	4,150	3,940	2,540	6,520	1,770	1,660	2,990	1,880	3,160
29	32,000	.....	18,800	4,370	3,730	2,540	5,560	1,880	1,660	2,260	1,880	4,150
30	21,500	.....	15,500	4,150	3,340	5,080	6,520	2,990	4,600	2,130	2,000	7,080
31	9,750	.....	11,800	.....	3,340	.....	4,600	2,130	.....	2,260	.....	7,080

NOTE.—Daily discharge determined from a rating curve well defined between 2,500 and 15,000 second-feet. Daily discharge Jan. 27–29 and Mar. 14–17 estimated from a hydrograph comparison with stations in the Chattahoochee River basin.

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Monthly discharge of Chattahoochee River at West Point, Ga., for 1913.

[Drainage area, 3,300 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	a 35,000	3,340	7,810	2.37	2.73	B.
February	17,500	4,370	7,940	2.41	2.51	A.
March	a 45,000	4,600	15,800	4.79	5.52	B.
April	9,760	4,150	5,820	1.76	1.96	A.
May	7,500	3,340	4,180	1.27	1.46	A.
June	7,000	2,540	3,920	1.19	1.33	A.
July	6,520	2,260	3,820	1.16	1.34	A.
August	8,000	1,770	3,190	.967	1.11	A.
September	4,600	1,560	2,030	.618	.69	B.
October	5,800	1,420	2,570	.779	.90	B.
November	2,260	1,770	1,950	.591	.66	B.
December	7,000	2,130	2,980	.903	1.04	A.
The year	a 45,000	1,420	5,160	1.56	21.25	

a Estimated.

SWEETWATER CREEK NEAR AUSTELL, GA.

Location.—About 1¼ miles from Austell, Ga.; a quarter of a mile south of Lithia Springs Park; about 1½ miles downstream from Southern Railway bridge; 2 miles below Noses Creek; 1½ miles above Stricklands bridge, and 6 miles above junction of Sweetwater Creek with Chattahoochee River.

Records available.—May 6, 1904, to December 31, 1905, and November 3 to December 27, 1913.

Drainage area.—245 square miles.

Gage.—Staff gage in two sections; lower section, inclined, reading to 8 feet, is fastened to solid rock on right bank; upper section, reading 8 to 16 feet, fastened vertically to a tree on right bank about 100 feet upstream. Gage read twice daily.

Channel and control.—A rocky shoal more than a mile below the gage is the apparent control. The bottom between the gage and control is composed of silt which shifts and probably changes the discharge relation.

Discharge measurements.—Made at Southern Railway bridge, Stricklands bridge, or by boat or wading near gage.

Regulation.—Small water-power plants above cause considerable diurnal fluctuation during low stages.

Accuracy.—Mean gage height for individual days, particularly during low-water periods, may be considerably in error owing to diurnal fluctuation.

Cooperation.—Station reestablished in the fall of 1913 by P. H. Whittier and F. K. McCullough, students in the Georgia School of Technology. Survey instruments were used and the work was directed by the district engineer.

Discharge measurements of Sweetwater Creek near Austell, Ga., in 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 28	Whittier and McCullough	1.95	122
Nov. 4	.....do	1.58	80
11	.....do	1.65	89

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Daily gage height, in feet, of Sweetwater Creek near Austell, Ga., for 1904, 1905, and 1913.

[J. L. Causey, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.								
1	.....	3.4	1.9	1.5	1.9	0.9	0.9	1.65
2	.....	2.5	1.45	1.6	1.7	.65	1.05	1.6
3	.....	1.9	1.3	4.4	1.6	1.05	.95	1.8
4	.....	1.6	1.25	2.9	3.0	.7	1.6	1.85
5	.....	1.5	1.2	3.9	2.65	1.05	1.8	2.5
6	.....	1.5	1.1	3.85	2.05	.75	1.7	3.65
7	.....	1.95	1.05	2.3	1.7	.95	1.4	2.6
8	.....	1.7	1.35	11.9	1.65	.9	1.35	2.25
9	.....	1.45	1.35	16.3	1.6	.65	1.25	2.05
10	.....	1.3	1.15	11.4	1.45	.9	1.25	2.05
11	.....	1.2	1.1	4.95	1.4	.9	1.25	2.2
12	.....	1.2	1.05	6.3	1.3	.85	1.3	2.0
13	.....	1.1	1.15	4.3	1.25	.9	1.65	1.85
14	.....	1.0	.9	3.45	1.25	.95	2.1	1.75
15	.....	1.0	1.0	3.25	1.35	.85	1.75	1.75
16	.....	1.15	1.05	4.55	1.1	.55	1.45	1.8
17	.....	1.0	.55	3.2	.9	1.0	1.4	1.85
18	1.5	1.0	1.0	3.45	1.2	.7	1.35	1.75
19	1.5	1.0	.75	2.4	1.2	.7	1.45	1.8
20	1.45	1.9	.75	1.95	1.05	.85	1.4	1.65
21	1.45	2.8	.75	2.15	1.1	.7	1.45	1.65
22	1.35	3.5	.9	2.0	1.1	.75	1.8	1.6
23	1.3	2.15	1.15	1.95	1.0	.6	2.4	1.7
24	1.3	1.7	.7	2.65	1.15	1.0	2.0	1.65
25	1.25	1.3	1.05	4.05	1.0	.9	1.75	1.65
26	1.15	1.15	1.0	5.5	1.05	.9	1.6	1.65
27	1.2	1.2	.9	7.15	.85	.85	1.45	1.75
28	1.2	2.4	1.25	6.0	1.1	.85	1.6	3.45
29	1.15	5.6	2.5	3.1	1.05	.9	1.5	3.25
30	1.3	2.85	2.2	2.35	.95	.5	1.5	3.2
31	2.55	.....	1.65	2.1	.....	.95	.....	2.5

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	2.1	3.0	3.1	2.35	2.75	1.75	4.0	1.8	1.85	7.2	1.85	2.05
2	2.05	2.6	3.0	2.35	2.35	1.7	3.6	1.65	1.95	5.4	1.7	2.45
3	2.1	2.45	3.0	2.35	2.45	1.6	2.55	1.65	2.1	2.8	1.55	9.6
4	2.05	2.55	2.8	2.3	2.55	1.6	2.2	1.65	3.3	2.45	1.75	12.9
5	2.0	2.45	2.8	2.55	2.35	1.65	5.6	1.5	2.7	2.35	1.75	6.7
6	3.3	2.5	2.8	2.9	2.45	1.55	4.6	1.4	2.55	2.05	1.75	4.0
7	2.8	2.55	2.8	2.8	2.1	1.35	7.0	1.7	1.65	1.85	1.75	3.6
8	2.75	4.4	2.8	2.75	2.15	1.45	11.6	1.45	1.55	1.7	1.8	5.8
9	2.55	7.2	2.85	2.8	2.4	1.25	8.6	1.8	1.55	1.6	1.8	10.2
10	2.3	10.2	3.4	2.65	2.1	1.25	8.8	3.1	1.6	1.65	2.6	11.6
11	2.8	8.6	4.0	2.6	1.95	1.05	9.2	3.4	1.1	2.4	3.4	10.4
12	11.2	6.0	4.1	2.6	1.75	1.0	16.7	4.7	1.65	2.35	3.0	6.4
13	14.4	6.5	3.6	2.5	1.65	1.15	10.7	8.2	1.65	2.2	2.5	4.0
14	11.4	6.8	3.2	2.4	1.65	1.45	5.1	4.4	1.7	2.0	2.2	3.4
15	4.7	6.4	3.0	2.55	1.7	1.55	3.4	3.9	1.35	1.95	2.1	3.5
16	3.4	6.0	2.9	2.8	2.85	1.55	2.9	4.4	1.35	2.0	2.0	3.5
17	3.5	5.6	2.8	2.55	4.0	1.45	2.65	3.9	1.45	2.1	1.95	3.6
18	3.0	5.3	2.75	2.5	2.7	1.35	2.3	3.8	1.6	1.4	1.95	3.5
19	3.0	5.2	2.7	2.4	2.05	1.5	2.25	3.6	1.5	1.8	1.95	3.6
20	3.2	6.6	2.85	2.4	1.9	1.95	2.3	2.8	1.4	1.7	2.0	5.2
21	3.0	7.1	3.7	2.3	1.85	1.4	2.1	2.65	1.35	1.75	1.95	6.4
22	2.8	6.9	3.7	2.2	2.45	1.7	2.1	2.85	1.25	1.65	2.05	6.1
23	2.45	5.5	3.1	2.2	2.9	2.3	1.85	3.9	1.25	1.65	1.9	5.7
24	2.4	4.4	2.85	2.2	5.1	2.7	1.75	5.8	1.4	1.65	1.95	5.2
25	2.2	3.7	2.55	2.15	4.5	2.5	2.35	6.5	1.4	1.85	2.1	4.9
26	2.1	3.4	2.5	2.2	3.3	2.1	2.4	4.1	1.35	2.4	2.5	4.4
27	2.25	3.2	2.5	2.2	2.7	2.85	1.9	2.8	1.3	2.4	2.65	4.0
28	2.2	3.2	2.45	2.1	2.4	3.0	1.75	2.05	1.15	2.2	2.6	3.8
29	2.25	.....	2.4	2.5	2.3	3.6	1.9	1.9	1.15	2.0	2.25	3.6
30	2.4	.....	2.5	2.6	2.3	2.7	2.15	1.7	1.65	1.8	2.05	3.4
31	3.2	.....	2.4	.....	2.0	.....	1.8	1.7	.....	1.75	.....	3.4

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Daily gage height, in feet, of Sweetwater Creek near Austell, Ga., for 1904, 1905, and 1913—Continued.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1913.								
1	.....	2.7	11	1.75	1.8	21	1.55	1.7
2	.....	3.7	12	1.7	1.8	22	1.6	1.8
3	1.8	2.0	13	1.7	1.7	23	1.6	1.8
4	1.75	2.2	14	1.7	1.7	24	1.65	1.9
5	1.7	.....	15	1.7	1.8	25	1.55	1.9
6	1.7	.....	16	1.6	1.8	26	1.55	3.0
7	1.7	1.9	17	1.6	1.8	27	1.55	2.8
8	1.7	1.9	18	1.7	1.8	28	1.65	.....
9	1.8	1.9	19	1.55	1.8	29	1.75	.....
10	1.9	1.9	20	1.55	1.7	30	1.8	.....

Daily discharge, in second-feet, of Sweetwater Creek near Austell, Ga., for 1904, 1905, and 1913.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.								
1	.....	270	110	80	110	45	45	90
2	.....	167	76	87	94	35	52	87
3	.....	110	67	440	87	52	48	102
4	.....	87	64	210	222	37	87	106
5	.....	80	61	344	182	52	102	167
6	.....	80	55	336	124	39	94	305
7	.....	114	52	147	94	48	73	177
8	.....	94	70	3,560	90	45	70	142
9	.....	76	70	5,760	87	35	64	124
10	.....	67	58	3,310	76	45	64	124
11	.....	61	55	568	73	45	64	137
12	.....	61	52	985	67	43	67	119
13	.....	55	58	420	64	45	90	106
14	.....	50	45	277	64	48	128	98
15	.....	50	50	252	70	43	98	98
16	.....	58	52	470	55	32	76	102
17	.....	50	32	246	45	50	73	106
18	80	50	50	277	61	37	70	98
19	80	50	39	157	61	37	76	102
20	76	110	39	114	52	43	73	90
21	76	199	39	132	55	37	76	90
22	70	284	45	119	55	39	102	87
23	67	132	58	114	50	33	157	94
24	67	94	37	182	58	50	119	90
25	64	67	52	371	50	45	98	90
26	58	58	50	720	52	45	87	90
27	61	61	45	1,320	43	43	76	98
28	61	157	64	880	55	43	87	277
29	58	750	167	234	52	45	80	252
30	67	204	137	152	48	30	80	246
31	172	.....	90	128	.....	48	.....	167

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Daily discharge, in second-feet, of Sweetwater Creek near Austell, Ga., for 1904, 1905, and 1913—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	128	222	234	152	194	98	362	102	106	1,340	106	124
2	124	177	222	152	152	94	298	90	114	690	94	162
3	128	162	222	152	162	87	172	90	128	199	84	2,410
4	124	172	199	147	172	87	137	90	258	162	98	4,060
5	119	162	199	172	152	90	750	80	188	152	98	1,140
6	258	167	199	210	162	84	480	73	172	124	98	362
7	190	172	199	199	128	70	1,260	94	90	106	98	298
8	194	440	199	194	132	76	3,410	76	84	94	102	810
9	172	1,340	204	199	157	64	1,910	102	84	87	102	2,710
10	147	2,710	270	182	128	64	2,010	234	87	90	177	3,410
11	199	1,910	362	177	114	52	2,210	270	55	157	270	2,810
12	3,210	880	380	177	98	50	5,960	505	90	152	222	1,020
13	4,810	1,060	238	167	90	58	2,960	1,740	90	137	167	362
14	3,310	1,180	216	157	90	76	605	440	94	119	137	270
15	505	1,020	222	172	94	84	270	344	70	114	128	284
16	270	880	210	199	204	84	210	440	70	119	119	284
17	284	750	199	172	362	76	182	344	76	128	114	298
18	222	660	194	167	188	70	147	328	87	73	114	284
19	222	630	188	157	124	80	142	298	80	102	114	296
20	246	1,100	204	157	110	114	147	199	73	94	119	630
21	222	1,300	312	147	106	73	128	182	70	98	114	1,020
22	199	1,220	312	137	162	94	128	204	64	90	124	915
23	162	720	234	137	210	147	106	344	64	90	110	780
24	157	440	204	137	605	188	98	810	73	90	114	630
25	137	312	172	132	460	167	152	1,060	73	106	128	555
26	128	270	167	137	258	128	157	380	70	157	167	440
27	142	246	167	137	188	204	110	199	67	157	182	362
28	137	246	162	128	157	222	98	124	58	137	177	298
29	142	.....	157	167	147	298	110	110	58	119	142	298
30	157	.....	167	177	147	188	132	94	90	102	124	270
31	246	.....	157	.....	119	.....	102	94	.....	98	.....	270

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1913.			1913.			1913.		
1	.....	188	11	98	102	21	84	94
2	.....	312	12	94	102	22	87	102
3	102	119	13	94	94	23	87	102
4	98	137	14	94	94	24	90	110
5	94	128	15	94	102	25	84	110
6	94	119	16	87	102	26	84	222
7	94	110	17	87	102	27	84	199
8	94	110	18	94	102	28	90	.....
9	102	110	19	84	102	29	98	.....
10	110	110	20	84	94	30	102	.....
						31	.....	.....

NOTE.—Daily discharge determined from a rating curve fairly well defined between 50 and 2,000 second-feet; discharge Dec. 5 and 6, 1913, interpolated. Determinations for individual days subject to error, owing to regulation of the stream by the operation of power plants, and should be used with caution.

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Monthly discharge of Sweetwater Creek near Austell, Ga., for 1904–5.

[Drainage area, 245 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1904.						
May 18–31	172	58	75.5	0.308	0.16	C.
June	750	50	125	.510	.57	B.
July	167	32	62.5	.255	.29	C.
August	5,760	80	722	2.95	3.40	B.
September	222	43	76.5	.312	.35	C.
October	52	30	42.4	.173	.20	C.
November	157	45	82.5	.337	.38	B.
December	305	87	131	.535	.62	B.
1905.						
January	4,810	119	539	2.20	2.54	B.
February	2,710	162	734	3.00	3.12	B.
March	380	157	221	.902	1.04	B.
April	210	128	163	.665	.74	B.
May	605	90	180	.735	.85	B.
June	298	50	109	.445	.50	B.
July	5,960	96	805	3.29	3.79	B.
August	1,740	73	308	1.26	1.45	B.
September	258	55	92.8	.379	.42	B.
October	1,340	73	177	.722	.83	B.
November	270	84	131	.535	.60	B.
December	4,060	124	899	3.67	4.23	B.
The year	5,960	50	3[illegible]3	1.48	20.11	
1913.						
November 3–30	110	84	92.4	.377	.39	B.
December 1–27	312	94	125	.510	.51	B.

FLINT RIVER NEAR WOODBURY, GA.

Location.—At the Macon & Birmingham Railroad bridge, 3 miles east of Woodbury, Ga., about a third of a mile above the mouth of Cane Creek and a quarter of a mile below Elkins Creek.

Records available.—March 29, 1900, to December 31, 1913.

Drainage area.—1,090 square miles.

Gage.—Vertical staff, in four sections, on the left bank about 300 feet above the railroad bridge. Datum of gage 660 feet above sea level.

Channel—Bottom is rough, consisting chiefly of rock, and currents are irregular. Above gage height 10 feet the banks are subject to overflow for a width of about 350 feet, but all water passes beneath the bridge and its approaches.

Discharge measurements.—Made from downstream side of railroad bridge, which does not make a right angle with the current.

Regulation.—The operation of power plants on tributary streams above the station affects the daily flow at low stages.

Accuracy.—Since October 1, 1912, the records are based on two gage-height readings a day, and as the operation of the power plants above causes some diurnal fluctuation the estimates of daily discharge may be considerably in error for individual days, especially at low stages. The discharge rating curve was fairly constant for a number of years, but changed considerably in 1909 and 1910, probably owing to conditions at the shoals half a mile below. The highway bridge built a short distance below the gage in September, 1911, materially affected the conditions of flow and necessitated the use of a new rating curve.

Cooperation.—Since July 1, 1910, morning readings have been furnished by United States Weather Bureau. Afternoon readings since October 1, 1912, have been furnished by Central Georgia Power Co.

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Discharge measurements of Flint River near Woodbury, Ga., in 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 17.	Warren E. Hall	11.62	22,100
18.	do	8.84	14,100
18,	do	8.08	13,000

Daily gage height, in feet, of Flint River near Woodbury, Ga., for 1913.

[E. T. Riggins, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.45	2.6	3.8	2.5	0.9	0.6	0.4	1.25	0.5	0.8	0.5	0.75
2	1.4	2.0	3.6	2.1	.9	.5	.5	1.15	.45	.75	.5	1.1
3	1.4	2.5	2.8	1.9	.9	.9	.65	1.85	.4	.65	.5	1.2
4	1.35	4.3	2.4	1.8	.8	1.65	.9	1.8	.4	.5	.5	1.05
5	1.3	4.0	1.9	1.75	.7	1.35	.75	1.25	1.2	.35	.4	.9
6	1.25	2.8	1.75	1.65	.7	1.55	.95	.9	1.45	.25	.4	.8
7	1.2	2.2	1.6	1.55	.7	1.85	.8	.7	1.05	.2	.4	.9
8	1.2	1.9	1.6	1.45	.7	3.0	.55	1.35	.95	.2	.45	.95
9	1.15	1.6	1.55	1.4	.7	3.2	.4	1.15	.95	.2	.45	.9
10	1.1	1.45	1.6	1.3	.7	2.7	.45	.75	.75	.2	.4	.85
11	1.1	1.35	1.95	1.4	.7	2.7	2.8	.6	.5	.2	.4	.75
12	1.2	1.75	2.2	1.5	.7	1.75	1.85	1.15	.4	.2	.4	.7
13	1.3	1.7	5.4	1.4	.7	1.2	1.45	.85	.3	.2	.4	.7
14	1.3	1.6	7.5	1.35	.7	.95	1.75	.65	.3	.1	.4	.7
15	1.25	1.5	14.8	1.3	.7	.85	1.65	.6	.3	.1	.5	.7
16	1.2	1.4	13.6	1.3	.65	.75	1.6	.9	.4	.2	.5	.7
17	1.1	1.3	11.8	1.25	.6	.65	1.1	.7	.4	.2	.5	.7
18	1.1	1.2	8.6	1.2	.9	.6	.95	.45	.6	.15	.5	.65
19	1.1	1.2	5.0	1.2	.9	.6	.8	.4	1.65	.75	.5	.6
20	1.1	1.65	3.5	1.15	.9	.55	.75	.35	1.9	.85	.5	.6
21	1.1	3.8	4.1	1.0	1.0	.5	1.25	.25	1.25	.7	.5	.6
22	1.1	3.6	5.6	.95	.9	.5	1.95	.2	1.1	.7	.5	.6
23	1.15	3.2	4.6	.9	1.4	.5	3.0	.15	1.0	.75	.5	.6
24	1.4	2.4	3.6	.9	1.65	.5	3.8	.45	.9	1.15	.5	.6
25	1.85	1.9	2.8	.9	1.5	.45	3.2	.45	.8	1.3	.5	.8
26	2.0	1.6	2.4	.9	1.35	.4	3.8	.4	.6	1.2	.5	.9
27	2.8	2.3	2.8	.9	1.15	.35	1.8	.25	.35	.95	.5	1.0
28	3.2	4.0	3.6	.9	.9	.3	1.6	.1	.4	.8	.5	.9
29	3.7	.....	3.5	.9	.75	.3	2.1	.15	.3	.7	.5	1.3
30	4.0	.....	3.1	.9	.7	.3	2.4	.3	.45	.6	.5	1.5
31	2.8	.....	3.2	.....	.6	.....	2.0	.35	.....	.55	.....	1.75

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Daily discharge, in second-feet, of Flint River near Woodbury, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,180	2,440	4,200	2,310	700	483	371	998	424	620	424	584
2	1,130	1,700	3,900	1,810	700	424	424	912	398	584	424	870
3	1,130	2,310	2,720	1,590	700	700	516	1,540	371	516	424	955
4	1,080	4,980	2,180	1,490	620	1,360	700	1,490	371	424	424	828
5	1,040	4,500	1,590	1,440	548	1,080	584	998	955	347	371	700
6	998	2,720	1,440	1,360	548	1,260	742	700	1,180	301	371	620
7	955	1,930	1,310	1,260	548	1,540	620	548	828	279	371	700
8	955	1,590	1,310	1,180	548	3,000	454	1,080	742	279	398	742
9	912	1,310	1,260	1,130	548	3,300	371	912	742	279	398	700
10	870	1,180	1,310	1,040	548	2,580	398	584	584	279	371	660
11	870	1,080	1,640	1,130	548	2,580	2,720	483	424	279	371	584
12	955	1,440	1,930	1,220	548	1,440	1,540	912	371	279	371	548
13	1,040	1,400	6,960	1,130	548	955	1,180	660	323	279	371	548
14	1,040	1,310	11,400	1,080	548	742	1,440	516	323	239	371	548
15	998	1,220	31,300	1,040	548	660	1,360	483	323	239	424	548
16	955	1,130	27,700	1,040	516	584	1,310	700	371	279	424	548
17	870	1,040	22,600	998	483	516	870	548	371	279	424	548
18	870	955	14,100	955	700	483	742	398	483	259	424	516
19	870	955	6,200	955	700	483	620	371	1,360	584	424	483
20	870	1,360	3,750	912	700	454	584	347	1,590	660	424	483
21	870	4,200	4,660	785	785	424	998	301	998	548	424	483
22	870	3,900	7,350	742	700	424	1,640	279	870	548	424	483
23	912	3,300	5,490	700	1,130	424	3,000	259	785	584	424	483
24	1,130	2,180	3,900	700	1,360	424	4,200	398	700	912	424	483
25	1,540	1,590	2,720	700	1,220	398	3,300	398	620	1,040	424	620
26	1,700	1,310	2,180	700	1,080	371	4,200	371	483	955	424	700
27	2,720	2,050	2,720	700	912	347	1,490	301	347	742	424	785
28	3,300	4,500	3,900	700	700	323	1,310	239	371	620	424	700
29	4,050	.....	3,750	700	584	323	1,810	259	323	548	424	1,040
30	4,500	.....	3,150	700	548	323	2,180	323	398	483	424	1,490
31	2,720	.....	3,300	.....	483	.....	1,700	347	.....	454	.....	1,440

NOTE.—Daily discharge determined from a rating curve fairly well defined below 24,000 second-feet. Because of uncertainties due to power regulation and lack of measurements between discharges of 2,000 and 12,000 second-feet, discharges for individual days should be used with caution.

Monthly discharge of Flint River near Woodbury, Ga., for 1913.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	4,500	870	1,420	1.30	1.50	B.
February	4,980	955	2,130	1.95	2.03	B.
March	31,300	1,260	6,190	5.68	6.55	B.
April	2,310	700	1,070	.982	1.10	C.
May	1,360	483	689	.632	.73	C.
June	3,300	323	947	.869	.97	C.
July	4,200	371	1,400	1.28	1.48	C.
August	1,540	239	602	.552	.64	C.
September	1,590	323	614	.563	.63	C.
October	1,040	239	475	.436	.50	C.
November	424	371	408	.374	.42	C.
December	1,490	483	691	.634	.73	C.
The year	31,300	239	1,390	1.28	17.28	

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FLINT RIVER NEAR CULLODEN, GA.

Location.—At Grays Ferry, 14 miles southwest of Culloden, Ga., 1½ miles above the mouth of Auchumpkee Creek, and about 3 miles above old gage near Musella, Ga., which was read for a short time in 1907.

Records available.—July 1, 1911, to December 31, 1913.

Drainage area.—2,000 square miles.

Gage.—Staff in four sections: Section reading 0.0 to 10.0 feet is a vertical timber well braced to a willow stump on left bank just below ferry landing; section reading 10.0 to 12.0 feet is a vertical timber fastened to a sycamore tree on bank, 5 feet to left of lower section; section reading 12.0 to 20.0 feet is on a vertical timber attached to a large water oak about 50 feet to left of ferry landing; section reading 20.0 to 21.0 feet is fastened directly to a large water oak 75 feet to left of ferry landing.

Channel and control.—Bed sandy and likely to shift at station; control, rock ledge half a mile below; probably permanent.

Discharge measurements.—Made from the ferryboat.

Accuracy.—Rating curve defined by measurements for stages below 3.5 feet only; above that point it was extended by use of area and velocity curves; accuracy of estimates depends on permanence of discharge relation.

No discharge measurements were made in 1913.

Daily gage height, in feet, of Flint River near Culloden, Ga., for 1913.

[F. A. Adams, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	5.0	2.7	2.2	1.9	3.0	1.9	2.25	2.2	2.1
2	.....	7.1	4.4	2.65	2.15	1.95	2.8	1.95	2.35	2.1	2.4
3	4.0	5.7	4.2	2.6	2.3	2.0	3.2	2.0	2.4	2.05	2.9
4	7.0	4.7	4.0	2.55	3.8	2.25	3.6	2.45	2.2	2.1	2.85
5	6.0	4.2	3.9	2.5	3.7	3.1	3.2	4.0	2.05	2.05	2.65
6	5.1	3.8	3.8	2.45	3.8	2.85	2.65	4.9	1.9	2.0	2.45
7	5.0	3.6	3.6	2.4	4.2	2.7	2.4	3.6	1.9	2.0	2.7
8	4.1	3.5	3.4	2.4	4.7	2.25	4.2	3.1	1.8	2.1	2.8
9	4.1	3.1	3.4	2.4	5.4	2.0	3.2	2.7	1.8	2.2	2.7
10	4.4	3.3	3.4	2.45	4.8	1.9	2.9	2.5	1.8	2.1	2.55
11	3.1	3.9	3.8	2.4	4.5	3.2	2.6	2.15	1.8	2.1	2.4
12	4.1	4.0	4.4	2.4	4.0	4.3	3.0	2.05	1.75	2.0	2.3
13	3.9	.....	3.8	2.4	3.2	3.1	2.85	1.95	1.65	2.0	2.3
14	3.5	.....	3.6	2.4	2.85	3.3	2.6	1.9	1.65	2.0	2.2
15	3.2	.....	3.4	2.35	2.6	3.4	2.4	1.9	1.65	2.0	2.25
16	3.1	30.5	3.3	2.3	2.5	3.2	2.25	2.0	1.65	2.1	2.3
17	3.1	.....	3.2	2.3	2.35	2.8	2.55	2.15	1.6	2.1	2.3
18	3.0	.....	3.2	2.6	2.3	2.6	2.25	2.1	1.65	2.1	2.3
19	3.0	.....	3.1	2.65	2.25	2.35	2.05	3.0	1.7	2.1	2.3
20	3.1	7.2	3.0	2.85	2.2	2.05	1.9	4.2	2.65	2.1	2.3
21	4.1	6.3	2.95	2.7	2.2	2.5	1.85	4.0	2.55	2.1	2.2
22	5.6	.....	2.9	2.7	2.25	3.8	1.85	3.2	2.4	2.1	2.2
23	5.3	8.1	2.8	2.6	2.1	4.2	1.8	2.9	2.3	2.1	2.3
24	4.3	7.2	2.8	3.4	2.1	5.6	2.4	2.6	3.1	2.1	2.3
25	3.9	5.6	2.8	3.4	2.1	5.2	2.2	2.35	3.4	2.1	2.6
26	3.2	5.6	2.8	3.4	2.0	4.8	1.9	2.15	3.0	2.1	2.5
27	3.3	7.0	2.8	2.9	2.0	3.8	2.0	2.05	2.85	2.1	2.5
28	6.0	6.9	2.8	2.6	2.0	3.6	1.85	2.0	2.55	2.1	2.5
29	.....	6.0	2.75	2.45	2.0	4.6	1.8	1.95	2.45	2.1	2.35
30	.....	5.4	2.7	2.3	1.95	4.0	1.85	2.1	2.35	2.1	4.0
31	.....	5.2	.....	2.2	.....	3.6	1.9	.....	2.25	.....	2.5

NOTE.—Water over top of gage Mar. 1, 13-19, and 22. Until Apr. 1 the gage read only to 10 feet. On that date it was extended to read to 21 feet. Gage height of 30.5 feet given for Mar. 16 is the peak flood height determined with a level from flood marks.

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Daily discharge, in second-feet, of Flint River near Culloden, Ga., for 1913.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	4,050	1,310	890	665	1,590	665	930	890	810
2	.....	7,720	3,220	1,260	850	700	1,400	700	1,010	810	1,050
3	2,700	5,170	2,960	1,220	970	735	1,790	735	1,050	772	1,490
4	7,520	3,630	2,700	1,180	2,460	930	2,230	1,090	890	810	1,440
5	5,680	2,960	2,580	1,130	2,340	1,690	1,790	2,700	772	772	1,260
6	4,200	2,460	2,460	1,090	2,460	1,440	1,260	3,910	665	735	1,090
7	4,050	2,230	2,230	1,050	2,960	1,310	1,050	2,230	665	735	1,310
8	2,830	2,120	2,010	1,050	3,630	930	2,960	1,690	598	810	1,400
9	2,830	1,690	2,010	1,050	4,670	735	1,790	1,310	598	890	1,310
10	3,220	1,900	2,010	1,090	3,770	665	1,490	1,130	598	810	1,180
11	1,690	2,580	2,460	1,050	3,350	1,790	1,220	850	598	810	1,050
12	2,830	2,700	3,220	1,050	2,700	3,090	1,500	772	566	735	970
13	2,580	.....	2,460	1,050	1,790	1,690	1,440	700	504	735	970
14	2,120	.....	2,230	1,050	1,440	1,500	1,270	665	504	735	890
15	1,790	.....	2,010	1,010	1,220	2,010	1,050	665	504	735	930
16	1,690	.....	1,900	970	1,130	1,790	970	735	504	810	970
17	1,690	.....	1,790	970	1,010	1,400	1,180	850	473	810	970
18	1,590	.....	1,790	1,220	970	1,220	930	810	504	810	970
19	1,590	.....	1,690	1,260	930	1,010	772	1,590	534	810	970
20	1,690	7,920	1,590	1,440	890	772	665	2,960	1,260	810	970
21	2,830	6,220	1,540	1,310	890	1,130	632	2,700	1,180	810	890
22	5,000	.....	1,490	1,310	930	2,460	632	1,790	1,050	810	890
23	4,510	9,840	1,400	1,220	810	2,960	598	1,490	970	810	970
24	3,090	7,920	1,400	2,010	810	5,000	1,050	1,220	1,690	810	970
25	2,580	5,000	1,400	2,010	810	4,350	890	1,010	2,010	810	1,220
26	1,790	5,000	1,400	2,010	735	3,770	665	850	1,590	810	1,400
27	1,900	7,520	1,400	1,490	735	2,460	735	772	1,440	810	1,400
28	5,680	7,330	1,400	1,220	735	2,230	632	735	1,180	810	1,400
29	.....	5,680	1,360	1,090	735	3,490	598	700	1,090	810	1,440
30	.....	4,670	1,310	970	700	2,700	632	810	1,010	810	2,700
31	.....	4,350	.....	890	.....	2,230	665	.....	930	.....	2,460

NOTE.—Daily discharge determined from a rating curve fairly well defined below 3,000 second-feet; discharge above 6,000 second-feet only approximate.

Monthly discharge of Flint River near Culloden, Ga., for 1913.

[Drainage area, 2,000 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
February 3–28	7,520	1,590	3,060	1.53	1.48	C.
April	4,050	1,310	2,050	1.02	1.14	B.
May	2,010	890	1,230	.615	.71	B.
June	4,670	700	1,610	.805	.90	B.
July	5,000	665	1,910	.955	1.10	B.
August	2,960	598	1,160	.580	.67	B.
September	3,910	665	1,290	.645	.72	B.
October	2,010	473	899	.450	.52	B.
November	890	735	798	.399	.45	B.
December	2,700	810	1,220	.610	.70	B.

FLINT RIVER AT ALBANY, GA.

Location.—At the Dougherty County highway bridge in the city of Albany, 700 feet below the Atlantic Coast Line Railroad bridge.

Records available.—April 10, 1893, to December 31, 1913 (United States Weather Bureau gage heights). Discharge measurements were begun by the Geological Survey in 1901, and estimates of daily discharge have been made from January 1, 1902, to December 31, 1913.

Drainage area.—5,000 square miles.

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Gage.—Standard chain gage, installed at the bridge by the United States Geological Survey April 20, 1904. The original staff gage was washed out in 1898. It was again injured in 1902, and on June 18, 1902, a new gage was installed by the United States Weather Bureau at a datum 0.75 foot lower than that of the former gage. The 1902 gage heights, as published by the United States Weather Bureau and the United States Geological Survey, all refer to the new gage datum. The present standard chain gage has the same datum and reads in conformity with the United States Weather Bureau gage.

Channel and control.—Channel at and below gage may shift slightly, but the control is such that conditions of flow are practically permanent. The river overflows both banks, but only under the approaches to the bridge.

Discharge measurements.—Fairly accurate measurements can be made at the section at the Atlantic Coast Line bridge, although it is very rough, and train switching in the railroad yard interferes with the work. The section at the Georgia Northern Railway bridge, 1 mile above, at which measurements are sometimes made, is considered better, especially for medium and low stages.

Regulation.—Power developments on Muckalee Creek, which joins Flint River about 2 miles above the station, cause considerable diurnal fluctuation, especially at low stages. It is probable that the flow is also affected by other power plants farther up the river.

Accuracy.—As the records are based on one gage reading a day, made at 7 a. m., it is probable that the estimates of daily discharge are somewhat in error, especially at low stages. The actual daily discharge is probably greater than that indicated by the 7 a. m. reading; accuracy of rating curve depends on permanence of discharge relation.

Cooperation.—Gage heights are furnished by the United States Weather Bureau.

No discharge measurements were made during 1913.

Daily gage height, in feet, of Flint River at Albany, Ga., for 1913.

[D. W. Brosnan, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.7	7.2	8.6	14.3	3.8	1.8	1.4	6.4	2.5	1.0	1.6	0.9
2	7.2	7.6	10.4	14.3	3.6	1.6	1.4	6.6	1.7	1.2	1.4	.8
3	7.7	8.0	13.8	14.2	3.6	2.1	1.3	6.0	1.4	1.5	1.2	1.0
4	7.7	8.6	17.5	13.7	3.5	2.4	1.0	4.8	1.2	1.5	1.3	1.0
5	7.5	9.4	18.2	11.9	3.4	2.8	1.0	4.6	1.1	1.3	1.3	1.1
6	7.2	9.6	17.5	10.3	3.0	3.0	.9	5.2	.9	1.2	1.1	1.5
7	6.4	9.8	16.8	8.9	2.9	3.5	1.4	4.9	1.5	1.0	.9	1.9
8	5.8	10.1	15.5	8.1	2.9	3.8	1.9	5.2	2.5	.9	.8	1.7
9	5.5	10.3	12.8	7.6	2.8	4.1	1.7	4.1	4.0	.7	.8	2.0
10	5.2	10.3	9.4	7.1	2.7	4.4	1.7	4.4	3.8	.5	.8	2.2
11	5.1	9.3	7.6	6.5	2.7	4.6	1.4	5.1	3.1	.4	.9	2.2
12	4.9	7.3	6.5	7.0	2.7	6.1	1.0	4.9	2.6	.3	1.8	2.2
13	4.7	6.4	6.5	9.5	2.7	6.4	1.2	3.6	2.3	.3	1.7	2.0
14	4.7	6.6	8.0	11.1	2.6	6.2	1.8	3.1	1.7	.5	1.4	2.0
15	4.6	7.2	13.0	12.4	2.6	5.2	2.8	2.8	1.4	.5	1.4	2.2
16	4.6	7.2	21.1	11.8	2.5	4.0	2.4	2.5	1.6	.8	1.4	1.8
17	4.4	7.0	25.2	10.5	2.5	3.6	2.2	2.8	2.4	.3	1.4	1.7
18	4.2	6.2	26.3	8.1	2.5	2.8	2.1	3.0	3.0	.3	1.2	1.8
19	4.1	5.5	28.1	7.1	2.5	2.4	2.0	3.1	2.5	.2	1.2	1.5
20	4.0	5.3	30.0	6.5	2.4	1.8	1.6	3.0	3.1	.1	1.0	1.6
21	4.0	5.2	30.3	6.0	2.4	1.5	1.4	2.4	3.8	.5	.9	1.8
22	4.0	5.5	29.4	5.6	2.5	1.3	1.2	1.8	4.5	.8	.8	1.8
23	4.0	6.2	27.9	5.2	2.9	1.3	1.2	1.6	4.8	1.8	.9	1.5
24	3.9	7.1	25.5	5.0	3.0	1.3	2.5	1.0	5.0	2.0	.9	1.4
25	3.9	7.6	23.5	4.6	3.0	1.2	4.7	1.5	4.6	2.3	1.1	1.4
26	4.0	8.1	20.4	4.3	3.0	1.1	5.3	1.2	3.4	2.9	1.1	1.8
27	4.0	8.1	19.0	4.3	3.0	1.1	5.9	1.6	2.5	3.3	1.0	2.1
28	5.0	8.6	18.0	4.3	2.7	1.0	6.3	1.6	1.9	3.2	.9	2.4
29	6.4	.....	17.0	4.3	2.7	.9	6.6	1.3	1.5	2.9	.9	2.4
30	6.6	.....	16.0	4.1	2.5	.9	6.3	1.3	1.5	2.4	.9	2.4
31	6.9	.....	15.3	.....	2.2	.....	5.9	2.5	.....	2.4	.....	2.5

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Daily discharge, in second-feet, of Flint River at Albany, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10,300	9,670	11,400	19,100	5,560	3,380	3,020	8,670	4,080	2,670	3,200	2,580
2	9,670	10,200	13,700	19,100	5,320	3,200	3,020	8,920	3,290	2,840	3,020	2,500
3	10,360	10,700	18,300	18,900	5,320	3,670	2,930	8,170	3,020	3,110	2,840	2,670
4	10,300	11,400	24,400	18,200	5,210	3,980	2,670	6,700	2,840	3,110	2,930	2,670
5	10,000	12,400	25,600	15,600	5,100	4,410	2,670	6,480	2,760	2,930	2,930	2,760
6	9,670	12,700	24,400	13,500	4,640	4,640	2,580	7,180	2,580	2,840	2,760	3,110
7	8,670	12,900	23,200	11,800	4,520	5,210	3,020	6,820	3,110	2,670	2,580	3,480
8	7,920	13,300	21,000	10,800	4,520	5,560	3,480	7,180	4,080	2,580	2,500	3,270
9	7,540	13,500	16,900	10,200	4,410	5,900	3,290	5,930	5,760	2,420	2,500	3,570
10	7,180	13,500	12,400	9,540	4,300	6,240	3,290	6,240	5,560	2,200	2,500	3,770
11	7,060	12,300	10,200	8,800	4,300	6,480	3,020	7,060	4,750	2,170	2,580	3,770
12	6,820	9,800	8,800	9,420	4,300	8,300	2,670	6,820	4,190	2,090	3,380	3,770
13	6,590	8,670	8,800	12,500	4,300	8,670	2,840	5,320	3,870	2,090	3,290	3,570
14	6,590	8,920	10,700	14,600	4,190	8,420	3,380	4,750	3,290	2,250	3,020	3,570
15	6,480	9,670	17,200	16,300	4,190	7,180	4,410	4,410	3,020	2,250	3,020	3,770
16	6,480	9,670	31,400	15,500	4,080	5,780	3,980	4,080	3,200	2,500	3,020	3,380
17	6,240	9,420	40,900	13,800	4,080	5,320	3,770	4,410	3,980	2,090	3,020	3,290
18	6,020	8,420	43,500	10,800	4,080	4,410	3,670	4,640	4,640	2,020	2,840	3,380
19	5,900	7,540	48,000	9,540	4,080	3,980	3,570	4,750	4,080	2,010	2,840	3,110
20	5,780	7,300	52,900	8,800	3,980	3,380	3,200	4,640	4,750	1,930	2,670	3,200
21	5,780	7,180	53,700	8,170	3,980	3,110	3,020	3,980	5,560	2,250	2,580	3,380
22	5,780	7,540	51,300	7,670	4,080	2,930	2,840	3,380	6,360	2,500	2,500	3,380
23	5,780	8,420	47,400	7,180	4,520	2,930	2,840	3,200	6,700	3,380	2,580	3,110
24	5,670	9,540	41,600	6,940	4,640	2,930	4,080	2,670	6,940	3,570	2,580	3,020
25	5,670	10,200	36,800	6,480	4,640	2,840	6,590	3,110	6,480	3,870	2,760	3,020
26	5,780	10,800	29,900	6,130	4,640	2,760	7,300	2,840	5,100	4,520	2,760	3,380
27	5,780	10,800	27,000	6,130	4,640	2,760	8,040	3,200	4,080	4,980	2,670	3,670
28	6,940	11,400	25,200	6,130	4,300	2,670	8,540	3,200	3,480	4,860	2,580	3,980
29	8,670	.....	23,500	6,130	4,300	2,580	8,920	2,930	3,110	4,520	2,580	3,980
30	8,920	.....	21,800	5,900	4,080	2,580	8,540	2,930	3,110	3,980	2,580	3,980
31	9,300	.....	20,600	.....	3,770	.....	8,040	4,080	.....	3,980	.....	4,080

NOTE.—Daily discharge determined from a rating curve well defined between 2,500 and 48,000 second-feet.

Monthly discharge of Flint River at Albany, Ga., for 1913.

[Drainage area, 5,000 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area.)	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	10,300	5,670	7,410	1.48	1.71	A.
February	13,500	7,180	10,300	2.06	2.14	A.
March	53,700	8,800	27,200	5.44	6.27	B.
April	19,100	5,900	11,100	2.22	2.48	A.
May	5,560	3,770	4,450	.890	1.03	A.
June	8,670	2,580	4,540	.908	1.01	A.
July	8,920	2,580	4,300	.860	.99	A.
August	8,920	2,670	5,120	1.02	1.18	A.
September	6,940	2,580	4,260	.852	.95	A.
October	4,980	1,930	2,950	.590	.68	A.
November	3,380	2,500	2,790	.558	.62	A.
December	4,080	2,500	3,360	.672	.77	A.
The year	53,700	1,930	7,310	1.46	19.83	

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FLINT RIVER AT BAINBRIDGE, GA.

Location.—At county wagon bridge half a mile from Bainbridge and about 25 miles above confluence of Flint and Chattahoochee rivers.

Records available.—January 1, 1908, to December 31, 1913.

Drainage area.—7,410 square miles (United States Weather Bureau).

Gage.—Standard chain gage attached to highway bridge.

Channel and control.—Bed soft and likely to shift, but appears to have remained fairly permanent, as indicated by constancy of discharge relation.

Accuracy.—It is possible that daily discharge as determined by one gage-height reading a day may be somewhat in error for individual days; otherwise the accuracy is good for low and medium stages; accuracy of rating curve depends on permanence of discharge relation.

Cooperation.—Gage heights are furnished by the United States Weather Bureau.

No discharge measurements were made during 1913.

Daily gage height, in feet, of Flint River at Bainbridge, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.9	10.4	13.6	21.0	9.7	7.2	5.6	9.7	6.1	5.7	5.9	4.6
2	11.5	10.6	15.1	20.2	9.4	6.8	6.0	9.9	6.5	5.4	5.6	4.6
3	11.3	10.7	16.3	19.9	9.2	6.6	5.9	10.0	6.4	5.3	5.3	4.6
4	11.6	11.2	17.4	19.9	9.2	6.8	5.9	9.1	6.0	5.6	5.1	4.6
5	11.5	12.1	18.6	19.3	9.0	7.0	5.7	8.9	5.8	5.6	5.1	4.7
6	11.3	13.0	19.8	18.0	8.8	7.2	5.7	8.7	5.7	5.5	5.0	4.8
7	11.2	13.3	20.2	16.8	8.6	7.7	5.6	8.9	5.6	5.3	4.8	5.2
8	11.1	13.5	19.7	15.5	8.5	8.0	6.0	8.8	5.7	5.2	4.9	5.3
9	11.0	13.5	19.0	14.8	8.3	8.1	6.3	8.6	6.5	5.0	4.7	5.3
10	10.8	13.4	17.9	14.1	8.2	8.7	6.1	8.2	7.2	4.9	4.7	5.2
11	10.6	13.5	15.8	13.8	8.3	9.2	6.0	8.2	7.4	4.8	4.7	5.2
12	10.5	13.3	14.2	13.4	8.1	9.8	5.8	8.7	7.0	4.6	5.2	5.4
13	10.2	12.2	13.2	13.8	8.1	10.2	5.7	8.4	6.5	4.7	5.3	5.3
14	9.0	11.8	13.3	14.8	7.9	10.5	5.6	7.9	6.2	4.5	5.2	5.2
15	9.0	11.4	14.2	15.8	7.9	10.4	5.7	7.5	5.8	4.4	5.1	5.1
16	8.9	11.6	17.2	16.5	7.8	9.9	6.4	7.0	5.5	4.3	5.1	5.0
17	8.8	11.7	21.2	16.6	7.8	9.0	6.4	6.7	5.7	4.4	4.9	5.1
18	8.6	11.4	24.2	15.9	7.7	8.2	6.3	6.8	5.8	4.2	4.7	5.0
19	8.5	11.0	26.8	14.6	7.6	7.8	6.3	6.9	6.1	4.4	4.8	5.0
20	8.4	10.4	28.2	13.5	7.6	7.4	6.2	6.5	6.2	4.4	4.7	5.0
21	8.3	10.0	29.4	12.7	7.5	6.9	6.0	6.3	6.8	4.2	4.7	5.0
22	8.3	10.0	30.7	12.1	7.4	6.6	6.0	6.0	7.3	4.3	4.9	4.9
23	8.2	10.0	31.4	11.7	7.6	6.5	6.2	5.8	7.8	4.4	4.8	4.9
24	8.3	10.8	31.2	11.3	8.0	6.3	7.0	5.6	8.0	5.1	4.8	5.0
25	8.3	11.6	30.3	11.0	7.9	6.2	7.9	5.4	8.2	5.4	4.7	5.1
26	8.5	11.9	28.7	10.6	7.7	6.2	8.7	5.3	7.6	5.7	4.7	4.9
27	8.7	12.0	27.0	10.3	7.8	6.0	9.0	5.3	6.9	5.8	4.8	5.1
28	9.0	12.1	25.3	10.1	7.8	5.9	9.2	5.6	6.5	6.4	4.7	5.3
29	9.8	.....	23.5	10.0	7.8	5.9	9.7	5.7	5.9	6.6	4.7	5.5
30	10.6	.....	22.4	9.9	7.6	5.7	9.9	5.6	5.7	6.4	4.6	5.6
31	10.2	.....	21.7	.....	7.3	.....	9.9	5.6	.....	6.1	.....	5.6

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Daily discharge, in second-feet, of Flint River at Bainbridge, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	14,500	11,500	.....	.....	10,300	6,960	5,530	10,300	5,960	5,610	5,780	4,730
2	13,700	11,900	.....	.....	9,780	6,590	5,870	10,600	6,320	5,370	5,530	4,730
3	13,300	12,100	.....	.....	9,460	6,410	5,780	10,800	6,230	5,290	5,290	4,730
4	13,900	13,100	.....	.....	9,460	6,590	5,780	9,310	5,870	5,530	5,130	4,730
5	13,700	15,000	.....	.....	9,160	6,770	5,610	9,020	5,690	5,530	5,130	4,810
6	13,300	.....	.....	.....	8,880	6,960	5,610	8,740	5,610	5,450	5,050	4,890
7	13,100	.....	.....	.....	8,600	7,480	5,530	9,020	5,530	5,290	4,890	5,210
8	12,900	.....	.....	.....	8,460	7,830	5,870	8,880	5,610	5,210	4,970	5,290
9	12,700	.....	.....	.....	8,200	7,950	6,140	8,600	6,320	5,050	4,810	5,290
10	12,300	.....	.....	.....	8,070	8,740	5,960	8,070	6,960	4,970	4,810	5,210
11	11,900	.....	.....	.....	8,200	9,460	5,870	8,070	7,160	4,890	4,810	5,210
12	11,700	.....	.....	.....	7,950	10,400	5,690	8,740	6,770	4,890	5,210	5,370
13	11,200	15,200	.....	.....	7,950	11,200	5,610	8,330	6,320	4,810	5,290	5,290
14	9,160	14,300	.....	.....	7,710	11,700	5,530	7,710	6,050	4,660	5,210	5,210
15	9,160	13,500	.....	.....	7,710	11,500	5,610	7,260	5,690	4,590	5,130	5,130
16	9,020	13,900	.....	.....	7,590	10,600	6,230	6,770	5,450	4,520	5,130	5,050
17	8,880	14,100	.....	.....	7,590	9,160	6,230	6,500	5,610	4,590	4,970	5,130
18	8,600	13,500	.....	.....	7,480	8,070	6,140	6,590	5,690	4,450	4,810	5,050
19	8,460	12,700	.....	.....	7,370	7,590	6,140	6,680	5,960	4,590	4,890	5,050
20	8,330	11,500	.....	.....	7,370	7,160	6,050	6,320	6,050	4,590	4,810	5,050
21	8,200	10,800	.....	.....	7,260	6,680	5,870	6,140	6,590	4,450	4,810	5,050
22	8,200	10,800	.....	15,000	7,160	6,410	5,870	5,870	7,060	4,520	4,970	4,970
23	8,070	10,800	.....	14,100	7,370	6,320	6,050	5,690	7,590	4,590	4,890	4,970
24	8,200	12,300	.....	13,300	7,830	6,140	6,770	5,530	7,830	5,130	4,890	5,050
25	8,200	13,900	.....	12,700	7,710	6,050	7,710	5,370	8,070	5,370	4,810	5,130
26	8,460	14,500	.....	11,900	7,480	6,050	8,740	5,290	7,370	5,610	4,810	4,890
27	8,740	14,700	.....	11,300	7,590	5,870	9,160	5,290	6,680	5,690	4,890	5,130
28	9,160	15,000	.....	11,000	7,590	5,780	9,460	5,530	6,320	6,230	4,810	5,290
29	10,400	.....	.....	10,800	7,590	5,780	10,300	5,610	5,780	6,410	4,810	5,450
30	11,900	.....	.....	10,600	7,370	5,610	10,600	5,530	5,610	6,230	4,730	5,530
31	11,200	.....	.....	.....	7,060	.....	10,600	.....	.....	5,960	.....	5,530

NOTE.—Daily discharge determined from a rating curve well defined below 15,000 second-feet. On days for which no discharge is given it was greater than 16,000 second-feet.

Monthly discharge of Flint River at Bainbridge, Ga., for 1913.

[Drainage area, 7,410 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	14,500	8,070	10,700	1.44	1.66	A.
May	10,300	7,060	8,040	1.09	1.26	A.
June	11,700	5,610	7,660	1.03	1.15	A.
July	10,600	5,530	6,710	.906	1.04	A.
August	10,800	5,290	7,340	.991	1.14	A.
September	8,070	5,450	6,320	.853	.95	A.
October	6,410	4,450	5,160	.696	.80	A.
November	5,780	4,730	5,000	.675	.75	A.
December	5,530	4,730	5,100	.688	.79	A.

CHIPOLA RIVER NEAR ALTHA, FLA.

Location.—At Willis Bridge, 3½ miles west of Altha, Fla., about 3 miles upstream from mouth of Tenmile Creek and about 1 mile upstream from Luck and Tremble Shoals at head of navigation.

Records available.—November 21, 1912, to December 31, 1913.

Drainage area.—740 square miles.

Gage.—On November 21, 1912, a vertical staff gage was placed on left bank of river about 75 feet upstream from bridge. On April 22, 1913, a chain gage was established on the upstream handrail of wagon bridge. Since April 22 the chain gage has been used.

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Channel and control.—Rough, rocky bottom; no piers or obstructions in water. Current fairly swift and regular; bottom is composed mostly of soft limestone rock. During low and medium stages the rock shoal about 1 mile below forms an excellent control. At high stages this control is submerged and the discharge relation will probably be determined by the flat slope of river below the shoal. Both banks are steep and rocky and rarely overflow.

Discharge measurements.—Made from downstream side of single span steel highway bridge. Both piers are out of water on steep banks. Measurements below a gage height of about 12.0 feet can be made from the bridge. Extreme floods can not be measured from the bridge.

Floods.—Spring flood of 1912 reached gage height of about 30 feet (estimated).

Winter flow.—Not affected by ice.

Regulation.—None.

Point of zero flow.—Not yet determined.

Accuracy.—Data insufficient for construction of rating curve.

Cooperation.—Gage heights furnished by Mr. B. H. Hardaway.

Discharge measurements of Chipola River near Altha, Fla., in 1913.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 23	Warren E. Hall and B. M. Hall, jr	10.74	1,540
23	....do	10.69	1,530

Daily gage height, in feet, of Chipola River near Altha, Fla., for 1913.

[W. S. Newsom, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.9	10.0	13.4	15.2	10.0	.....	9.7	9.6	9.3	9.0	9.1	8.7
2	11.9	10.0	13.4	15.0	10.0	9.5	9.6	9.7	9.3	9.0	.....	8.7
3	11.9	10.9	13.5	14.4	10.0	9.5	9.6	.....	9.2	9.0	9.0	8.7
4	11.8	14.0	14.0	14.0	10.0	9.5	9.6	9.5	9.2	8.9	9.0	8.7
5	11.8	14.0	14.6	13.8	9.9	9.4	10.0	9.5	9.1	.....	9.0	8.7
6	11.9	14.2	16.4	13.4	9.9	9.5	.....	9.5	9.1	8.9	9.0	8.7
7	11.0	14.6	16.4	12.9	9.9	9.6	10.0	9.5	.....	8.9	9.0	.....
8	11.0	14.8	15.6	12.6	9.8	.....	9.9	9.4	9.3	8.9	9.0	8.9
9	10.8	14.8	15.5	12.1	9.8	9.6	9.9	9.4	9.2	8.9	.....	8.8
10	10.8	14.4	14.1	12.0	9.7	14.0	9.9	.....	9.2	8.9	9.0	8.8
11	10.6	14.2	16.1	12.0	9.7	13.4	9.9	9.4	9.1	8.9	9.0	8.8
12	10.6	14.0	16.1	12.9	9.7	12.6	9.9	9.4	9.1	.....	9.0	8.8
13	10.5	13.8	16.4	13.0	9.7	11.5	.....	9.4	9.1	8.9	9.0	8.8
14	10.4	13.1	17.1	12.9	9.7	10.6	9.9	9.3	.....	8.9	9.0	.....
15	10.4	13.0	18.4	12.8	9.8	.....	9.9	9.3	9.1	9.2	9.0	9.2
16	10.3	13.0	20.0	12.8	9.8	10.2	9.8	9.5	9.3	8.9	.....	9.2
17	10.1	13.0	20.0	12.7	10.1	9.9	9.8	.....	9.3	8.8	8.9	9.1
18	10.1	13.0	20.0	12.1	.....	9.8	9.8	9.4	9.4	8.8	8.9	9.0
19	10.0	12.9	20.1	11.9	9.8	9.7	9.8	9.4	9.3	.....	8.9	9.0
20	10.0	12.7	20.5	11.4	9.8	9.7	.....	9.4	9.2	9.1	8.9	9.1
21	10.0	12.6	20.1	11.1	9.7	9.6	10.0	9.3	.....	8.8	8.9	.....
22	9.9	12.2	21.1	10.9	9.8	.....	10.0	9.3	9.2	8.9	8.9	9.0
23	9.9	12.1	20.6	10.8	9.6	9.4	9.9	9.2	9.2	9.0	.....	9.0
24	10.0	12.1	20.0	10.6	10.2	9.4	9.9	.....	9.2	10.1	8.9	9.0
25	10.0	12.4	19.4	10.4	10.1	9.4	9.8	9.3	9.1	9.2	8.9	9.2
26	10.0	12.6	19.4	10.5	10.1	9.4	9.8	9.3	9.1	.....	8.9	9.2
27	10.0	12.9	19.4	10.5	10.0	9.4	.....	9.3	9.1	9.2	8.9	9.1
28	10.0	13.0	18.2	10.4	9.9	9.6	9.7	9.5	9.1	9.2	8.9	.....
29	10.0	.....	17.0	10.2	9.9	.....	9.7	9.5	9.1	9.2	8.9	9.0
30	10.0	.....	16.2	10.1	9.8	9.7	9.6	9.4	9.1	9.2	.....	9.0
31	10.0	.....	15.2	.....	9.7	.....	9.6	.....	.....	9.2	.....	9.1

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CHOCTAWHATCHEE RIVER BASIN.

PEA RIVER AT PERA, ALA.

Location.—At the Elton wagon bridge, half a mile west of Pera, Ala. It is about 10 miles above the mouth of Flat Creek, and no tributary streams except very small ones come in nearer the station.

Records available.—August 27, 1904, to August 31, 1913.

Drainage area.—1,180 square miles.

Gage.—Standard chain gage attached to the bridge; datum unchanged.

Channel and control.—In soft rock, nearly permanent.

Discharge measurements.—Made from the downstream side of the wagon bridge to which the gage is attached.

Regulation.—Power plants on Whitewater Creek, a tributary stream above the station, cause diurnal fluctuations in the low-water flow. The gage is read twice a day to lessen the effect of such fluctuations.

Accuracy.—The estimates of daily discharge may be considerably in error for individual days owing to the operation of the power plants above the station.

No discharge measurements made during 1913.

Daily gage height, in feet, of Pea River at Pera, Ala., for 1913.

[W. G. Early, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	11.2	11.7	18.1	12.6	5.8	3.7	3.9	9.0
2	10.8	11.2	18.4	11.8	5.7	3.7	4.8	7.5
3	10.4	12.0	17.7	11.2	5.6	3.4	5.2	6.4
4	10.2	12.8	15.5	10.3	5.4	4.4	4.4	5.6
5	9.6	11.4	14.0	10.7	5.2	4.4	6.4	5.0
6	9.2	11.4	12.2	10.3	5.0	5.0	5.4	4.4
7	9.0	12.1	10.7	9.8	4.9	7.1	5.4	4.1
8	8.8	13.3	9.9	9.1	4.8	8.2	4.6	3.9
9	8.7	11.3	9.2	8.8	4.8	8.6	3.8	4.0
10	8.3	9.6	11.6	8.6	4.7	10.3	5.0	4.0
11	8.0	9.0	15.0	11.7	4.8	9.8	4.4	4.6
12	9.0	9.1	13.2	13.6	4.9	7.8	3.9	4.8
13	9.7	9.2	15.2	12.4	4.6	7.3	3.6	4.6
14	8.6	9.2	25.7	11.5	5.6	6.9	3.4	4.4
15	8.0	9.2	31.8	10.8	5.4	6.2	4.0	4.6
16	7.8	8.5	38.0	9.2	5.0	5.2	3.8	5.0
17	7.9	8.2	37.9	9.1	5.6	4.6	3.6	4.2
18	8.0	7.8	35.2	8.8	7.0	4.2	3.4	3.7
19	8.1	7.6	32.6	8.6	5.5	4.0	3.3	3.3
20	8.2	7.6	28.2	7.6	5.1	4.2	4.2	2.4
21	8.1	7.5	23.1	7.1	4.6	4.2	8.8	2.0
22	7.7	12.8	27.0	6.8	4.6	4.0	13.8	1.6
23	7.4	15.5	26.0	6.6	4.9	3.9	14.8	2.3
24	7.5	12.6	22.4	6.4	7.8	3.8	12.8	2.6
25	8.2	10.8	18.5	6.2	7.3	3.6	13.8	2.8
26	8.4	9.7	15.6	6.4	6.3	3.5	13.6	2.9
27	9.7	10.0	15.0	6.6	5.4	3.5	14.2	3.0
28	11.2	15.2	16.2	6.4	5.0	3.6	11.2	3.6
29	9.8	.....	15.2	6.2	4.8	3.7	9.0	3.2
30	9.3	.....	14.1	6.2	3.4	4.0	9.7	2.7
31	9.4	.....	13.1	.....	3.6	.....	10.0	2.9

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Daily discharge, in second-feet, of Pea River at Pera, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	3,300	3,530	6,480	3,950	1,090	535	578	2,310
2	3,120	3,300	6,610	3,580	1,060	535	794	1,700
3	2,930	3,670	6,290	3,300	1,030	476	906	1,290
4	2,840	4,040	5,280	2,890	965	691	691	1,030
5	2,570	3,390	4,590	3,070	906	691	1,290	850
6	2,400	3,390	3,760	2,890	850	850	965	691
7	2,310	3,720	3,070	2,660	822	1,550	965	622
8	2,230	4,270	2,710	2,350	794	1,980	741	578
9	2,180	3,350	2,400	2,230	794	2,140	556	600
10	2,020	2,570	3,490	2,140	767	2,890	850	600
11	1,900	2,310	5,050	3,530	794	2,660	691	741
12	2,310	2,350	4,220	4,410	822	1,820	578	794
13	2,620	2,400	5,140	3,850	741	1,620	515	741
14	2,140	2,400	9,970	3,440	1,030	1,470	476	691
15	1,900	2,400	12,800	3,120	965	1,220	600	741
16	1,820	2,100	15,600	2,400	850	906	556	850
17	1,860	1,980	15,600	2,350	1,030	741	515	644
18	1,900	1,820	14,300	2,230	1,510	644	476	535
19	1,940	1,740	13,100	2,140	995	600	457	457
20	1,980	1,740	11,100	1,740	878	644	644	295
21	1,940	1,700	8,780	1,550	741	644	2,230	238
22	1,780	4,040	10,600	1,430	741	600	4,500	184
23	1,660	5,280	10,100	1,360	822	578	4,960	280
24	1,700	3,950	8,450	1,290	1,820	556	4,040	336
25	1,980	3,120	6,660	1,220	1,620	515	4,500	362
26	2,060	2,620	5,330	1,290	1,260	495	4,410	381
27	2,620	2,750	5,050	1,360	965	495	4,680	400
28	3,300	5,140	5,600	1,290	850	515	3,300	515
29	2,660	.....	5,140	1,220	794	535	2,310	438
30	2,440	.....	4,640	1,220	476	600	2,620	344
31	2,490	.....	4,180	.....	515	.....	2,750	381

NOTE.—Daily discharge determined from a rating curve well defined below 7,000 second-feet. Because of uncertainties due to power regulation and lack of measurements since 1911, daily discharge should be used with caution.

Monthly discharge of Pea River at Pera, Ala., for 1913.

[Drainage area, 1,180 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	3,300	1,660	2,290	1.94	2.24	B.
February	5,280	1,700	3,040	2.58	2.69	B.
March	15,600	2,400	7,290	6.18	7.12	B.
April	4,410	1,220	2,380	2.02	2.25	B.
May	1,820	476	945	.801	.92	C.
June	2,890	476	1,010	.856	.96	C.
July	4,960	457	1,750	1.48	1.71	B.
August	2,310	184	665	.564	.65	C.

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ESCAMBIA RIVER BASIN.

CONECUH RIVER AT BECK, ALA.

Location.—At Simmons Bridge, at Beck, about 12 miles below the mouth of Patsaliga Creek, 8 miles west of Andalusia, Ala., a station on the Central of Georgia and Louisville & Nashville railroads.

Records available.—August 24, 1904, to December 31, 1913.

Drainage area.—1,290 square miles.

Gage.—Standard chain gage attached to the upstream side of the wagon bridge; datum unchanged.

Channel and control.—In soft bedrock and practically permanent. Both banks are subject to overflow at high stages.

Discharge measurements.—Made from the wagon bridge.

Regulation.—The flow at times may be affected by logging operations.

Accuracy.—Conditions of flow at this station are practically permanent and a good rating curve has been developed.

No discharge measurements were made in 1913.

Daily gage height, in feet, of Conecuh River at Beck, Ala., for 1913.

[S. T. Dillard, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	13.2	13.5	11.2	4.4	.....	2.6	7.2	.....	4.5	3.4	2.8
2	10.7	.....	.....	10.4	4.3	2.5	2.5	7.0	2.0	4.3	.....	2.9
3	9.6	13.3	14.0	9.8	4.1	2.4	2.9	.....	2.2	4.0	2.9	3.3
4	8.9	13.2	12.8	9.4	.....	2.5	.....	4.0	2.1	3.9	2.8	3.3
5	.....	12.7	12.1	9.4	3.9	2.5	2.7	3.6	2.1	.....	2.6	3.4
6	7.9	12.2	12.2	.....	3.8	2.7	.....	3.0	2.2	3.8	2.5	3.4
7	7.5	12.0	11.8	8.3	3.7	3.0	3.2	3.0	.....	3.6	2.7	.....
8	7.1	12.9	10.2	7.9	3.6	.....	3.1	3.0	2.0	3.4	2.7	3.4
9	6.7	.....	.....	7.1	3.8	4.2	3.2	2.8	1.9	2.9	.....	3.5
10	6.4	13.6	10.8	7.0	3.5	4.8	3.0	.....	1.9	2.7	2.8	3.4
11	6.2	11.4	11.7	12.3	.....	4.2	2.8	2.9	1.8	2.6	2.6	3.8
12	.....	9.7	12.8	11.4	4.1	4.0	2.6	2.6	1.8	.....	2.5	3.9
13	6.6	9.0	18.9	.....	3.9	4.1	.....	2.7	1.7	2.5	2.4	4.0
14	6.5	8.3	25.2	9.2	3.7	4.0	2.9	2.8	.....	2.4	2.4	.....
15	6.3	8.1	30.1	8.4	3.5	.....	2.8	2.7	5.4	2.3	2.4	3.2
16	6.2	.....	.....	8.0	3.7	3.4	2.7	2.6	9.2	2.2	.....	3.2
17	6.1	7.4	.....	7.7	4.9	3.0	2.6	.....	8.4	2.0	2.3	3.3
18	6.0	7.3	.....	7.2	.....	2.8	2.6	2.4	8.0	2.1	2.3	3.4
19	.....	7.0	39.2	6.6	3.7	2.6	2.5	2.3	7.6	.....	2.4	3.4
20	6.0	6.7	35.3	.....	3.8	2.5	.....	2.2	5.0	3.4	2.5	3.4
21	5.9	6.4	32.4	5.8	3.6	2.5	2.6	2.0	.....	3.2	2.5	.....
22	5.7	.....	26.5	5.3	3.3	.....	7.6	1.9	4.8	3.6	2.6	3.3
23	5.6	.....	.....	5.2	3.9	2.4	6.5	1.8	3.7	3.8	.....	3.4
24	5.7	9.6	23.0	5.0	3.9	2.5	6.6	.....	3.4	4.1	2.6	3.4
25	6.2	7.8	19.2	4.8	.....	2.4	8.9	1.8	3.2	4.0	2.5	.....
26	.....	7.2	15.8	5.1	3.5	2.3	8.1	1.8	3.0	.....	2.4	3.6
27	9.6	7.0	15.4	.....	3.3	2.1	.....	1.7	2.7	3.9	.....	3.6
28	11.0	11.6	14.3	4.9	3.0	2.2	7.5	1.9	.....	3.8	2.4	.....
29	11.1	.....	13.7	4.8	2.9	.....	7.7	1.9	2.4	3.6	2.3	3.6
30	10.6	.....	.....	4.6	.....	2.8	7.6	1.8	2.4	3.5	.....	3.6
31	11.3	.....	11.8	.....	2.7	.....	7.4	.....	.....	3.4	.....	3.6

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Daily discharge, in second-feet, of Conecuh River at Beck, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,810	6,060	6,240	4,920	1,260	554	554	2,700	380	1,300	834	617
2	4,640	6,200	7,000	4,470	1,210	524	524	2,590	395	1,210	742	650
3	4,020	6,120	6,520	4,140	1,120	496	650	1,840	443	1,060	650	786
4	3,630	6,060	5,840	3,910	1,080	524	618	1,060	418	1,040	617	786
5	3,360	5,880	5,440	3,910	1,040	524	585	914	418	1,020	554	834
6	3,080	5,490	5,490	3,600	996	585	671	684	443	996	524	834
7	2,860	5,380	5,270	3,300	955	684	757	684	419	914	585	834
8	2,640	5 800	4,360	3,080	914	927	720	684	395	824	585	834
9	2,420	6,500	4,530	2,640	996	1,170	757	617	373	650	601	874
10	2,270	6,290	4,700	2,590	874	1,440	684	634	373	585	617	834
11	2,160	5,040	5,210	5,550	997	1,170	617	650	352	554	554	996
12	2,260	4,080	5,840	5,040	1,120	1,080	554	554	352	539	524	1,040
13	2,370	3,690	9,310	4,420	1,040	1,120	602	585	332	524	496	1,080
14	2,320	3,300	12,900	3,800	955	1,080	650	617	1,030	496	496	915
15	2,210	3,190	15,700	3,350	874	957	617	585	1,730	469	496	757
16	2,160	3,000	18,500	3,130	755	834	585	554	3,800	443	482	737
17	2,100	2,810	21,000	2,970	1,490	684	554	525	3,350	395	469	796
18	2,050	2,750	26,000	2,700	1,220	617	554	496	3,130	418	469	834
19	2,050	2,590	20,900	2,370	955	554	524	469	2,910	626	496	834
20	2,050	2,430	18,700	2,160	996	524	539	443	1,540	834	524	834
21	2,000	2,270	17,000	1,940	914	524	554	395	1,490	757	524	814
22	1,890	4,000	13,600	1,680	795	510	2,910	3.3	1,440	914	554	796
23	1,830	6,000	12,600	1,540	1,040	496	2,320	352	955	926	554	834
24	1,800	4,030	11,600	1,540	1,040	524	2,370	352	834	1,120	554	834
25	2,160	3,020	9,480	1,440	957	496	3,630	352	757	1,080	524	874
26	3,100	2,700	7,550	1,590	874	469	3,190	352	684	1,060	496	914
27	4,030	2,590	7,320	1,540	795	418	3,020	332	585	1,040	496	914
28	4,810	5,150	6,690	1,490	684	443	2,860	373	540	926	496	914
29	4,870	.....	6,350	1,440	650	530	2,970	373	496	914	469	914
30	4,500	.....	5,810	1,350	618	617	2,910	352	496	874	543	914
31	4,980	.....	5,270	.....	585	.....	2,810	366	.....	834	.....	914

NOTE.—Daily discharge determined from a rating curve well defined below 7,000 second-feet. For days when the gage was not read discharge was estimated from a hydrograph comparison with the flow of Pea River at Pera, Ala., or interpolated. As no measurements have been made since 1911, estimates of daily discharge should be used with caution.

Monthly discharge of Conecuh River at Beck, Ala., for 1913.

[Drainage area, 1,290 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	5,810	1,830	2,990	2.32	2.68	B.
February	a 6,500	2,270	4,380	3.40	3.54	C.
March	a 26,000	4,360	10,100	7.83	9.03	C.
April	5,550	1,350	2,920	2.26	2.52	B.
May	1,490	585	968	.750	.86	B.
June	1,440	418	702	.544	.61	B.
July	3,630	524	1,350	1.05	1.21	B.
August	2,700	332	706	.547	.63	B.
September	3,800	332	1,030	.798	.89	B.
October	1,300	395	823	.638	.74	B.
November	834	469	551	.427	.48	B.
December	1,060	617	851	.660	.76	B.
The year	a 26,000	332	2,270	1.76	23.95	

a Estimated.

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MOBILE RIVER BASIN.

OOSTANAULA RIVER AT RESACA, GA.

Location.—At the Western & Atlantic Railroad bridge in Resaca, Ga., 3 miles below the junction of Conasauga and Coosawattee rivers and 1 mile above the mouth of Camp Creek.

Records available.—1891 to 1898 (gage heights by the United States Weather Bureau and discharge measurements and gage heights by the United States Geological Survey); 1899 to 1904 partial records of gage heights; continuous records January 1, 1905, to December 31, 1913.

Drainage area.—1,610 square miles.

Gage.—Heavy vertical timber attached to the downstream side of the bridge pier in the middle of the river.

Channel and control.—Slightly shifting at and below the station. The left bank is low and overflows during high water for 480 feet.

Discharge measurements.—Usually made from the downstream side of the railroad bridge but at times are made from a boat at the ferry, about 200 feet above, where the section is somewhat better.

Regulation.—Except on the smaller tributaries there are very few milldams, and these have little or no effect on the flow at the station. The channel is sometimes obstructed by logs under the left span of the bridge.

Accuracy.—A good rating curve has been developed for low and medium stages.

Cooperation.—Gage heights are furnished by the United States Weather Bureau.

The following discharge measurement was made by Warren E. Hall and B. M. Hall, jr.:

October 22: Gage height, 2.25 feet; discharge, 702 second-feet.

Daily gage height, in feet, of Oostanaula River at Resaca, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	9.0	21.4	8.6	4.5	4.0	3.6	2.8	2.0	6.0	1.8	2.8
2	6.0	8.8	20.8	7.2	4.5	5.0	3.4	3.8	2.0	2.2	1.8	4.0
3	5.5	8.0	18.0	7.0	4.5	5.8	3.4	3.6	1.9	2.0	1.8	3.6
4	7.0	10.0	9.0	6.4	4.4	6.6	3.4	3.0	1.9	1.8	1.8	2.8
5	6.5	9.0	8.0	6.2	4.4	5.8	4.2	2.7	1.9	1.6	1.8	2.6
6	5.5	7.7	6.5	6.2	4.4	5.0	3.6	2.5	1.8	1.6	1.8	2.6
7	5.0	6.0	6.0	6.0	4.3	5.0	3.4	2.3	1.8	1.5	1.8	2.7
8	5.2	5.8	5.6	5.8	5.0	5.4	3.0	2.2	1.8	1.5	1.8	3.4
9	6.0	5.5	5.4	5.3	5.5	10.0	3.0	2.2	1.8	1.5	1.8	3.0
10	5.8	5.0	7.0	5.3	4.8	8.0	2.8	2.0	1.8	1.5	1.8	2.8
11	5.6	5.6	11.0	5.8	4.3	7.0	2.8	2.0	1.8	1.5	1.5	2.6
12	7.2	15.0	10.0	5.6	4.2	5.2	3.8	1.8	1.7	1.4	1.8	2.4
13	10.5	12.3	8.0	5.5	4.1	4.8	5.0	1.8	1.7	1.4	1.8	2.3
14	8.2	10.5	17.4	5.5	4.1	4.6	4.2	1.8	1.6	1.4	1.8	2.3
15	6.0	6.8	22.2	5.4	3.8	4.6	3.6	4.2	1.6	1.4	1.8	2.3
16	5.0	6.4	25.6	5.4	3.7	4.4	3.2	3.8	1.6	1.4	1.8	2.2
17	5.0	6.0	25.0	5.3	3.7	4.4	3.0	2.8	1.6	1.4	1.8	2.2
18	5.8	5.8	20.7	5.2	4.0	4.4	2.8	2.6	1.6	1.4	1.8	2.1
19	7.7	5.5	11.0	5.2	4.0	4.4	2.6	2.4	1.6	2.0	1.8	2.1
20	6.7	5.6	8.0	5.0	4.0	4.3	2.4	2.2	1.8	1.6	1.8	2.0
21	5.4	11.2	8.5	5.0	4.0	4.3	2.3	2.0	1.8	1.6	1.8	2.0
22	5.8	10.0	12.6	5.0	4.0	4.8	2.4	2.0	3.3	1.6	1.8	2.0
23	5.8	8.0	11.4	4.8	4.4	4.6	2.4	2.0	3.0	1.8	1.8	2.2
24	6.4	7.2	9.0	4.8	12.0	4.4	2.4	2.0	2.4	1.6	1.8	2.5
25	11.2	6.0	7.1	4.8	11.0	4.0	2.4	1.9	2.0	1.5	1.8	2.8
26	11.2	5.5	7.5	4.8	9.2	3.8	3.7	1.7	1.8	1.5	1.8	3.0
27	12.4	10.6	16.2	4.7	7.4	3.6	7.0	1.7	1.6	1.5	1.7	3.2
28	14.5	20.4	19.0	4.7	6.0	3.6	5.0	1.7	1.5	3.0	1.7	3.2
29	12.3	.....	19.5	4.6	4.5	3.6	3.5	1.7	1.6	2.6	1.7	3.8
30	11.5	.....	17.4	4.6	4.0	3.6	3.0	3.2	7.0	2.0	1.7	4.2
31	10.7	.....	11.6	.....	4.0	.....	3.0	2.0	.....	1.8	.....	5.0

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Daily discharge, in second-feet, of Oostanaula River at Resaca, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,110	5,870	18,000	5,510	2,120	1,760	1,500	1,030	640	3,270	560	1,030
2	3,270	5,690	17,400	4,280	2,120	2,500	1,380	1,630	640	726	560	1,760
3	2,880	4,980	14,600	4,110	2,120	3,110	1,380	1,500	600	640	560	1,500
4	4,110	6,780	5,870	3,600	2,040	3,770	1,380	1,140	600	560	560	1,030
5	3,680	5,870	4,980	3,430	2,040	3,110	1,900	972	600	486	560	920
6	2,880	4,720	3,680	3,430	2,040	2,500	1,500	870	560	486	560	920
7	2,500	3,270	3,270	3,270	1,970	2,500	1,380	772	560	452	560	972
8	2,650	3,110	2,960	3,110	2,500	2,800	1,140	726	560	452	560	1,380
9	3,270	2,880	2,800	2,730	2,880	6,780	1,140	726	560	452	560	1,140
10	3,110	2,500	4,110	2,730	2,350	4,980	1,030	640	560	452	560	1,030
11	2,960	2,960	7,730	3,110	1,970	4,110	1,030	640	560	452	560	920
12	4,280	11,600	6,780	2,960	1,900	2,650	1,630	560	522	420	560	830
13	7,250	8,980	4,980	2,880	1,830	2,350	2,500	560	522	420	560	772
14	5,190	7,250	14,000	2,880	1,830	2,200	1,900	560	486	420	560	772
15	3,270	3,940	18,800	2,800	1,630	2,200	1,500	1,900	486	420	560	772
16	2,500	3,600	22,200	2,800	1,570	2,040	1,260	1,630	486	420	560	726
17	2,500	3,270	21,600	2,730	1,570	2,040	1,140	1,030	486	420	560	726
18	3,110	3,110	17,300	2,650	1,760	2,040	1,030	920	486	420	560	682
19	4,720	2,880	7,730	2,650	1,760	2,040	920	820	486	640	560	682
20	3,850	2,960	4,980	2,500	1,760	1,970	820	726	560	486	560	640
21	2,800	7,920	5,420	2,500	1,760	1,970	770	640	560	486	560	640
22	3,110	6,780	9,270	2,500	1,760	2,350	820	640	1,320	486	560	640
23	3,110	4,980	8,110	2,350	2,040	2,200	820	640	1,140	560	560	726
24	3,600	4,280	5,870	2,350	8,690	2,040	820	640	820	486	560	870
25	7,920	3,270	4,200	2,350	7,730	1,760	820	600	640	452	560	1,030
26	7,920	2,880	4,540	2,350	6,050	1,630	1,570	522	560	452	560	1,140
27	9,070	7,350	12,800	2,270	4,450	1,500	4,110	522	486	452	522	1,260
28	11,100	17,000	15,600	2,270	3,270	1,500	2,500	522	452	1,140	522	1,260
29	8,980	.....	16,100	2,200	2,120	1,500	1,440	522	486	920	522	1,630
30	8,210	.....	14,000	2,200	1,760	1,500	1,140	1,260	4,110	640	522	1,980
31	7,440	.....	8,310	.....	1,760	.....	1,140	640	.....	560	.....	2,500

NOTE.—Daily discharge determined from a rating curve well defined below 7,000 second-feet.

Monthly discharge of Oostanaula River at Resaca, Ga., for 1913.

[Drainage area, 1,610 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	11,100	2,500	4,690	2.91	3.36	A.
February	17,000	2,500	5,380	3.34	3.48	A.
March	22,200	2,800	9,940	6.17	7.11	B.
April	5,510	2,200	2,920	1.81	2.02	A.
May	8,690	1,570	2,620	1.63	1.88	A.
June	6,780	1,500	2,510	1.56	1.74	A.
July	4,110	770	1,400	.870	1.00	A.
August	1,900	522	855	.531	.61	A.
September	4,110	452	718	.446	.50	A.
October	3,270	420	617	.383	.44	A.
November	560	522	555	.345	.39	A.
December	2,500	640	1,060	.658	.76	A.
The year	22,200	420	2,760	1.71	23.29	

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COOSA RIVER AT RIVERSIDE, ALA.

Location.—At the Southern Railway bridge at Riverside, Ala., 1 mile above mouth of Blue Eye Creek and about 7 miles above Choccolocco Creek.

Records available.—September 25, 1896, to December 31, 1913.

Drainage area.—7,060 square miles.

Gage.—Standard chain gage attached to right-bank end of downstream side of railroad bridge. The original wire gage was located on the downstream side of bridge near middle of river.

Channel and control.—Bed of stream rocky and permanent. For a part of the width the current is broken by a ledge above. Both banks high and do not overflow.

Discharge measurements.—Made from downstream side of railroad bridge.

Regulation.—The flow is not noticeably affected by artificial control at the comparatively few dams above. Four navigation locks have been constructed, the nearest of which is Lock 4, about 4 miles above the station.

No discharge measurements have been made since 1911. The accuracy of the rating curve depends on the permanency of the discharge relation.

Daily gage height, in feet, of Coosa River at Riverside, Ala., for 1913.

[J. E. Whitehead, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	11.2	14.2	12.0	3.0	2.7	2.2	3.4	1.2	5.3	1.0	3.8
2	4.2	11.0	14.4	10.8	3.0	2.7	2.2	3.0	1.3	6.2	.95	4.8
3	4.5	8.3	13.7	8.5	2.9	3.2	2.1	2.7	1.3	5.1	1.0	5.0
4	4.4	8.6	13.2	6.2	2.8	3.2	2.0	2.4	1.3	3.3	.95	3.8
5	4.6	8.8	12.4	5.8	2.7	3.4	1.8	2.2	1.2	3.0	1.0	3.2
6	4.7	8.2	9.7	5.4	2.5	3.4	1.6	1.9	1.1	1.9	.95	2.6
7	4.6	7.3	7.6	5.0	2.6	3.5	1.6	1.8	1.2	1.8	1.0	2.2
8	4.5	6.0	6.0	4.8	2.6	3.3	1.6	1.7	.95	1.4	.85	2.0
9	4.3	5.2	5.5	4.5	2.5	3.9	1.5	2.9	1.0	1.2	.9	2.0
10	4.3	5.0	6.8	4.5	2.7	3.8	1.6	3.3	.95	1.2	1.2	2.2
11	4.1	4.6	7.6	4.4	2.8	3.8	1.5	3.0	1.0	1.1	1.3	2.2
12	4.5	11.0	8.0	4.4	2.7	4.2	1.5	2.6	.95	1.0	1.1	2.0
13	5.4	13.4	8.9	4.3	2.6	3.6	1.4	1.9	.9	1.0	1.2	2.0
14	6.2	13.6	12.0	4.4	2.6	3.0	1.6	1.8	.85	.95	1.0	2.0
15	6.6	13.2	14.4	4.4	2.5	2.5	1.8	1.8	.8	1.0	1.0	2.0
16	5.9	11.7	14.5	3.9	2.4	2.3	2.1	1.6	.75	.95	.95	1.8
17	5.0	9.0	14.4	4.0	2.4	2.2	2.3	2.0	.85	1.0	.95	1.8
18	4.6	7.0	14.0	4.0	2.4	2.1	2.0	2.5	.95	1.0	1.0	1.7
19	5.5	5.7	13.7	3.7	2.3	1.9	1.7	2.2	1.0	1.0	1.0	1.6
20	5.7	5.5	13.6	3.6	2.4	2.0	1.6	2.0	.95	1.0	1.0	1.4
21	5.6	6.2	13.8	3.5	2.4	1.9	1.5	1.8	.95	1.0	1.0	1.4
22	5.5	7.3	14.0	3.4	2.4	1.8	1.4	1.6	.95	1.4	1.0	1.4
23	4.1	7.5	12.1	3.2	2.5	1.7	1.2	1.5	1.2	1.5	1.0	1.5
24	5.0	7.8	10.6	3.3	3.8	2.0	1.7	1.7	1.2	1.4	1.0	1.6
25	7.0	7.0	9.0	3.2	4.2	2.4	1.7	1.7	1.4	1.2	1.0	1.8
26	7.9	5.9	7.9	3.3	5.2	2.2	1.7	1.5	1.3	1.1	1.0	2.4
27	10.3	6.4	9.2	3.4	5.2	2.2	1.8	1.5	1.3	1.0	.9	2.5
28	12.4	13.2	12.0	3.3	5.0	2.0	2.4	1.3	1.2	1.0	.9	2.8
29	12.7	.....	12.9	3.2	3.9	1.7	3.5	1.2	1.3	.95	.9	2.8
30	12.6	.....	13.2	3.2	3.2	1.8	4.4	1.2	5.3	.95	1.2	3.5
31	12.2	.....	12.8	.....	2.8	.....	3.6	1.2	.....	1.0	.....	4.0

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Daily discharge, in second-feet, of Coosa River at Riverside, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10,300	39,280	52,000	42,600	7,140	6,250	4,900	8,380	2,620	14,900	2,260	9,660
2	11,000	38,300	52,800	37,500	7,140	6,250	4,900	7,140	2,810	18,300	2,170	13,100
3	12,000	26,900	49,800	27,700	6,840	7,750	4,640	6,250	2,810	14,200	2,260	13,800
4	11,700	28,100	47,700	18,300	6,540	7,750	4,380	5,420	2,810	8,060	2,170	9,660
5	12,400	29,000	44,300	16,800	6,250	8,380	3,890	4,900	2,620	7,140	2,260	7,750
6	12,700	26,400	32,800	15,300	5,700	8,380	3,430	4,130	2,440	4,130	2,170	5,970
7	12,400	22,700	23,900	13,800	5,970	8,700	3,430	3,890	2,620	3,890	2,260	4,900
8	12,000	17,500	17,500	13,100	5,970	8,060	3,430	3,660	2,170	3,010	2,000	4,380
9	11,300	14,500	15,600	12,000	5,700	9,980	3,220	6,940	2,260	2,620	2,080	4,380
10	11,300	13,800	20,600	12,000	6,250	9,660	3,430	8,060	2,170	2,620	2,620	4,900
11	10,600	12,400	28,900	11,700	6,540	9,660	3,220	7,140	2,260	2,440	2,810	4,900
12	12,000	38,300	25,600	11,700	6,250	11,000	3,220	5,970	2,170	2,260	2,440	4,380
13	15,300	48,500	29,400	11,300	5,970	9,620	3,010	4,130	2,080	2,260	2,620	4,380
14	18,300	49,400	42,600	11,700	5,970	7,140	3,430	3,890	2,000	2,170	2,260	4,380
15	19,800	47,700	52,800	11,700	5,700	5,700	3,890	3,890	1,920	2,260	2,260	4,380
16	17,100	41,300	53,200	9,980	5,420	5,160	4,640	3,430	1,840	2,170	2,170	3,890
17	13,800	29,800	52,800	10,300	5,420	4,900	5,160	4,380	2,000	2,260	2,170	3,890
18	12,400	21,400	51,100	10,300	5,420	4,640	4,380	5,700	2,170	2,260	2,260	3,660
19	15,600	16,400	49,800	9,340	5,160	4,130	3,660	4,900	2,260	2,260	2,260	3,430
20	16,400	15,600	49,400	9,020	5,420	4,380	3,430	4,380	2,170	2,260	2,260	3,010
21	16,000	18,300	50,200	8,700	5,420	4,130	3,220	3,890	2,170	2,260	2,260	3,010
22	15,600	22,700	51,100	8,380	5,420	3,890	3,010	3,430	2,170	3,010	2,260	3,010
23	10,600	23,500	43,000	7,750	5,700	3,660	2,620	3,220	2,620	3,220	2,260	3,220
24	13,800	24,800	36,600	8,060	9,660	4,380	3,660	3,660	2,620	3,010	2,260	3,430
25	21,400	21,400	29,800	7,750	11,000	5,420	3,660	3,660	3,010	2,620	2,260	3,890
26	25,200	17,100	25,200	8,060	14,500	4,900	3,660	3,220	2,810	2,440	2,260	5,420
27	35,300	19,000	30,700	8,380	14,500	4,900	3,890	3,220	2,810	2,260	2,080	5,700
28	44,300	47,700	42,600	8,060	13,800	4,380	5,420	2,810	2,620	2,260	2,080	6,540
29	45,600	.....	46,400	7,750	9,980	3,660	8,700	2,620	2,810	2,170	2,080	6,540
30	45,100	.....	47,700	7,750	7,750	3,890	11,700	2,620	14,900	2,170	2,620	8,700
31	43,400	.....	46,000	.....	6,540	.....	9,020	2,62	.....	2,260	.....	10,300

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of Coosa River at Riverside, Ala., for 1913.

[Drainage area, 7,060 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	45,600	10,300	18,900	2.68	3.09	A.
February	49,400	12,400	27,600	3.91	4.07	A.
March	53,200	15,600	39,900	5.65	6.51	B.
April	42,600	7,750	13,200	1.87	2.09	A.
May	14,500	5,160	7,260	1.03	1.19	A.
June	11,000	3,660	6,340	.898	1.00	A.
July	11,700	2,620	4,400	.623	.72	A.
August	8,380	2,620	4,560	.646	.74	A.
September	14,900	1,840	2,820	.399	.45	A.
October	18,300	2,170	4,170	.591	.68	A.
November	2,810	2,000	2,270	.322	.36	A.
December	13,800	3,010	5,760	.816	.94	A.
The year	53,200	1,840	11,400	1.61	21.84	

ALABAMA RIVER AT SELMA, ALA

Location.—At highway bridge in Selma, Ala.

Records available.—January 1, 1899, to December 31, 1913. The station was originally established by the United States Army Engineer Corps, but in 1890 gage height records were begun by the United States Weather Bureau. Although it is not thought that the discharge rating can be accurately applied further back than 1899, flow estimates based on earlier gage heights will probably be of some value.

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Drainage area.—15,400 square miles.

Gage.—Standard chain gage was installed by the United States Geological Survey March 22, 1906, on the downstream side of the highway bridge. The United States Weather Bureau gage formerly used was in two sections—the low-water portion reading from −3 to +5.1 feet, being fastened to the lower side of the cofferdam on second pier, and the upper portion, reading from 5.1 to 55 feet, being fastened to the draw pier. All gages have had the same datum, but the bad condition of a short low-water section caused some error in the low-water readings prior to 1906, especially those of the year 1904.

Channel and control.—In soft limestone, deep, with swift current, and difficult to sound even at ordinary stages. Both banks are high, but the left is subject to overflow at extreme high water. Discharge relation depends on an open channel below. No rock ledges or permanent control points are known to exist. The channel is mostly composed of marl, which does not shift easily, but work of Government dredge boats below may have some effect on the discharge relation.

Discharge measurements.—Made from the highway bridge, to which gage is attached.

Accuracy.—As little field work has been done at this station in several years, the data should be used with caution.

Cooperation.—Gage heights are furnished by the United States Weather Bureau.

No discharge measurements have been made since 1911.

Daily gage height, in feet, of Alabama River at Selma, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.5	37.7	25.2	32.2	7.5	6.1	3.2	7.1	0.7	4.4	1.7	0.1
2	9.9	36.1	29.9	30.7	7.1	5.2	2.9	7.1	1.1	6.5	1.5	.3
3	9.5	34.4	32.2	28.6	6.9	4.6	2.6	5.9	1.0	11.9	1.3	.6
4	9.5	33.8	32.8	25.6	6.6	4.4	2.9	5.5	.9	12.5	1.2	.9
5	10.1	33.6	31.8	22.3	6.4	4.5	2.9	5.4	1.2	9.9	1.0	4.0
6	10.3	33.8	29.6	18.0	6.2	5.7	2.8	5.5	2.2	7.2	.7	6.1
7	10.1	32.9	27.0	15.7	5.9	6.5	2.8	4.3	2.4	4.9	.6	5.6
8	9.6	30.2	23.9	13.9	5.8	6.2	2.4	3.5	2.6	3.3	.4	4.2
9	9.3	25.3	19.1	12.7	5.7	7.4	2.1	3.0	2.1	2.5	.2	3.5
10	9.2	20.4	17.3	12.0	5.6	10.2	1.9	3.2	2.0	1.8	.2	3.0
11	9.2	15.6	21.2	12.6	5.5	9.9	1.7	2.9	1.6	1.2	.3	2.9
12	9.0	13.2	27.1	13.1	5.7	9.4	1.9	3.2	1.5	.6	.1	3.0
13	9.7	12.5	32.9	13.4	5.9	7.7	2.6	3.9	2.2	.5	.0	2.9
14	11.5	17.2	36.7	12.9	5.8	7.1	2.7	3.4	2.2	.3	.1	2.5
15	12.9	21.7	40.8	12.0	5.7	6.6	4.0	2.9	1.5	.0	.1	2.4
16	13.1	24.2	43.9	11.1	5.4	5.7	4.9	2.4	1.7	.0	.1	2.3
17	12.6	24.3	46.9	10.6	5.2	4.8	4.2	2.3	2.1	−.1	.3	2.1
18	11.6	23.1	48.9	10.1	5.2	4.2	3.4	2.1	2.3	.0	.4	2.0
19	10.5	20.5	49.4	9.6	5.4	3.8	3.2	1.9	2.1	.0	.4	1.8
20	10.5	16.5	48.4	9.1	5.7	3.5	3.2	1.7	2.3	.1	.3	1.7
21	11.0	13.9	46.1	8.8	5.3	3.2	2.9	2.0	2.3	.4	.2	1.6
22	11.2	14.9	44.2	8.5	5.0	2.9	2.5	2.2	2.0	.6	.2	1.5
23	10.9	16.6	42.5	8.2	5.3	2.8	2.7	1.9	1.5	1.1	.2	1.5
24	10.4	17.7	41.4	7.8	5.7	2.6	3.3	1.9	1.0	1.5	.1	1.3
25	12.1	18.0	39.8	7.6	7.2	2.4	3.9	2.0	.9	1.4	.1	1.3
26	18.1	17.1	36.8	7.5	8.8	2.4	4.0	2.2	.8	3.1	.0	2.0
27	22.8	16.8	33.0	7.6	9.0	2.7	4.3	1.6	.9	4.9	.0	2.4
28	27.9	19.8	30.9	8.3	8.8	2.9	4.5	1.4	.9	4.3	.0	2.8
29	33.1	.....	31.5	8.6	8.9	3.0	4.4	1.4	1.1	3.2	.0	3.3
30	36.3	.....	32.7	8.1	8.4	2.8	4.7	1.1	1.8	2.4	.0	4.5
31	37.8	.....	33.0	.....	7.5	.....	6.0	.9	.....	1.9	.....	3.4

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Daily discharge, in second-feet, of Alabama River at Selma, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	27,400	101,000	65,800	85,400	20,700	17,700	11,900	19,800	7,290	14,200	9,060	6,270
2	26,100	96,300	78,900	81,200	19,800	15,800	11,300	19,800	7,980	18,600	8,700	6,610
3	25,200	91,500	85,400	75,300	19,400	14,600	10,700	17,300	7,800	30,800	8,340	7,120
4	25,200	89,800	87,000	66,900	18,800	14,260	11,300	16,400	7,630	32,200	8,160	7,630
5	26,500	89,300	84,200	58,000	18,300	14,400	11,300	16,200	8,160	26,100	7,800	13,400
6	27,000	89,800	78,100	46,400	17,900	16,900	11,100	16,400	9,980	20,000	7,290	17,700
7	26,500	87,300	70,800	40,400	17,300	18,600	11,100	14,000	10,400	15,200	7,120	16,700
8	25,400	79,800	62,300	35,700	17,100	17,900	10,400	12,400	10,700	12,100	6,780	13,800
9	24,700	66,100	49,400	32,700	16,900	20,500	9,790	11,500	9,790	10,600	6,440	12,400
10	24,500	52,900	44,600	31,000	16,700	26,800	9,420	11,900	9,600	9,240	6,440	11,500
11	24,500	40,200	55,000	32,400	16,400	26,100	9,060	11,300	8,880	8,160	6,610	11,300
12	24,000	34,000	71,100	33,700	16,900	24,900	9,420	11,900	8,700	7,120	6,270	11,500
13	25,600	32,200	87,300	34,400	17,300	21,100	10,700	13,200	9,980	6,950	6,100	11,300
14	29,800	44,300	98,000	33,200	17,100	19,800	10,900	12,300	9,980	6,610	6,270	10,900
15	33,200	56,400	110,000	31,000	16,900	18,800	13,400	11,300	8,700	6,100	6,270	10,400
16	33,700	63,100	119,000	28,800	16,200	16,900	15,200	10,400	9,060	6,100	6,270	10,200
17	32,400	63,400	128,000	27,700	15,800	15,000	13,800	10,200	9,790	5,940	6,610	9,790
18	30,000	60,200	134,000	26,500	15,800	13,800	12,300	9,790	10,200	6,100	6,780	9,600
19	27,400	53,200	135,000	25,400	16,200	13,000	11,900	9,420	9,790	6,100	6,780	9,240
20	27,400	42,500	132,000	24,200	16,900	12,400	11,900	9,060	10,200	6,270	6,610	9,060
21	28,600	35,700	125,000	23,600	16,000	11,900	11,300	9,600	10,200	6,780	6,440	8,880
22	29,100	38,300	120,000	22,900	15,400	11,300	10,600	9,980	9,600	7,120	6,440	8,700
23	28,400	42,800	115,000	22,200	16,000	11,100	10,900	9,420	8,700	7,980	6,440	8,700
24	27,200	45,600	112,000	21,400	16,900	10,700	12,100	9,420	7,800	8,700	6,270	8,340
25	31,200	46,400	107,000	20,900	20,000	10,400	13,200	9,600	7,630	8,520	6,270	8,340
26	46,700	44,100	98,300	20,700	23,600	10,400	13,400	9,980	7,460	11,700	6,100	9,600
27	59,400	43,300	87,600	20,900	24,000	10,900	14,000	8,880	7,630	15,200	6,100	10,400
28	73,300	51,300	81,700	22,500	23,600	11,300	14,400	8,520	7,630	14,000	6,100	11,100
29	87,900	.....	83,400	23,100	23,800	11,500	14,200	8,520	7,980	11,900	6,100	12,100
30	96,900	.....	86,900	22,000	22,700	11,100	14,800	7,980	9,240	10,400	6,100	14,400
31	101,000	.....	87,600	.....	20,700	.....	17,500	7,630	.....	9,420	.....	12,300

NOTE.—Daily discharge determined from a rating curve well defined by measurements made previous to 1911. As the accuracy of this rating curve depends on the permanency of the discharge relation, estimates of daily discharge should be used with caution.

Monthly discharge of Alabama River at Selma, Ala., for 1913.

[Drainage area, 15,400 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	101,000	24,000	37,300	2.42	2.79	A.
February	101,000	32,200	60,000	3.90	4.06	A.
March	135,000	44,600	92,900	6.03	6.95	A.
April	85,400	20,700	35,700	2.32	2.59	A.
May	24,000	15,400	18,400	1.19	1.37	B.
June	26,800	10,400	15,700	1.02	1.14	B.
July	17,500	9,060	12,000	.779	.90	B.
August	19,800	7,630	11,700	.760	.88	B.
September	10,700	7,290	8,950	.581	.65	B.
October	32,200	5,940	11,800	.766	.88	B.
November	9,060	6,100	6,770	.440	.49	B.
December	17,700	6,270	10,600	.688	.79	B.
The year	135,000	5,940	26,700	1.73	23.49	

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ETOWAH RIVER NEAR BALL GROUND, GA.

Location.—At the iron wagon bridge about 3 miles southeast of Ball Ground, Ga., and a quarter of a mile below mouth of Longswamp Creek.

Records available.—May 16, 1907, to December 31, 1913.

Drainage area.—466 square miles.

Gage.—A standard chain gage, read twice each day, attached to the upstream side of bridge, was installed August 18, 1908, replacing the vertical-staff gage, located 75 feet below bridge. The chain gage was set to read with the vertical staff at low stage, and will differ only very slightly at other stages.

Channel and control.—The left bank does not overflow, but the right bank overflows about 500 feet beyond end of bridge approach at high stages. The current is somewhat broken and is disturbed by rough, rocky bed and curved channel above.

Discharge measurements.—Made from upstream side of wagon bridge.

Regulation.—The operation of a number of mills above may cause slight variations in flow.

Accuracy.—The rating curve is somewhat affected by shifting of the stream bed some distance below the station.

The following discharge measurement was made by Warren E. Hall:
December 16: Gage height, 2.47 feet; discharge, 389 second-feet.

Daily gage height, in feet, of Etowah River near Ball Ground, Ga., for 1913.

[R. O. Ellis, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	4.2	5.5	5.4	4.0	3.3	3.0	2.8	2.3	3.3	2.3	3.8
2	3.4	3.9	5.0	5.2	3.9	3.6	2.9	3.2	2.2	2.65	2.3	3.1
3	3.7	5.1	4.6	5.2	3.9	3.8	2.8	2.9	2.2	2.5	2.3	2.75
4	3.6	5.4	4.4	5.1	3.8	3.4	2.9	2.8	2.2	2.4	2.3	2.6
5	3.4	4.6	4.3	4.9	3.8	3.6	3.2	2.65	2.3	2.3	2.3	2.6
6	3.4	4.2	4.2	4.8	3.8	3.4	2.9	2.5	2.5	2.3	2.3	2.6
7	3.3	4.0	4.1	4.8	3.8	3.6	2.7	3.6	2.35	2.2	2.3	3.4
8	3.3	3.8	4.0	4.7	3.9	3.6	2.6	3.7	2.2	2.2	3.2	2.9
9	3.2	3.7	4.0	4.7	3.9	3.5	2.6	2.95	2.2	2.2	2.8	2.65
10	3.3	3.7	7.6	4.6	3.9	3.4	2.7	2.7	2.1	2.2	2.6	2.6
11	3.4	5.6	6.8	4.9	3.7	3.3	2.8	2.45	1.95	2.1	2.4	2.6
12	5.2	7.2	5.4	4.7	3.7	3.2	3.3	2.45	2.1	2.1	2.4	2.5
13	4.2	5.0	8.2	4.6	3.7	3.2	3.0	3.0	2.1	2.1	2.5	2.5
14	3.7	4.5	13.1	4.6	3.7	3.1	2.9	4.0	2.1	2.0	2.4	2.4
15	3.4	4.2	13.6	4.6	3.6	3.1	2.8	4.2	2.2	1.95	2.4	2.6
16	3.4	4.1	7.9	4.5	3.6	3.0	2.7	3.3	2.4	2.0	2.5	2.5
17	3.4	4.0	6.5	4.4	3.7	3.0	2.6	2.7	2.4	2.0	2.4	2.5
18	3.8	3.9	5.8	4.4	3.6	3.0	2.6	2.5	2.4	2.2	2.4	2.5
19	3.6	3.8	5.6	4.3	3.6	3.0	2.5	2.4	2.4	2.8	2.3	2.5
20	3.6	4.8	5.4	4.3	3.7	3.0	2.5	2.3	2.3	2.75	2.4	2.5
21	3.6	4.6	7.2	4.2	3.6	3.0	2.6	2.4	2.8	2.45	2.3	2.5
22	3.4	4.8	5.9	4.2	3.6	3.2	2.5	2.4	2.65	2.3	2.3	2.5
23	3.4	4.4	5.3	4.2	7.8	3.1	2.8	2.7	2.5	2.3	2.4	2.7
24	4.4	4.2	5.2	4.1	5.0	3.0	2.95	2.5	2.4	3.4	2.3	2.75
25	4.8	4.0	5.1	4.1	4.0	3.0	4.4	2.4	2.25	3.0	2.3	3.2
26	4.4	4.0	5.3	4.1	3.7	2.9	4.7	2.3	2.1	2.6	2.3	3.4
27	9.9	9.2	11.6	4.2	3.7	2.9	5.7	2.3	2.0	2.55	2.2	3.0
28	5.9	7.6	7.4	4.2	3.7	3.5	3.9	2.3	2.0	2.5	2.2	2.7
29	4.7	.....	6.1	4.1	3.6	3.7	3.4	3.1	3.5	2.4	2.25	3.3
30	4.3	.....	5.9	4.1	3.5	3.5	3.2	2.8	5.1	2.4	2.4	4.0
31	4.3	.....	5.6	.....	3.4	.....	3.0	2.4	.....	2.4	.....	3.7

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Daily discharge, in second-feet, of Etowah River near Ball Ground, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	880	1,200	2,020	1,950	1,080	735	600	520	350	735	350	980
2	780	1,030	1,680	1,810	1,030	880	560	690	325	462	350	645
3	930	1,740	1,430	1,810	1,030	980	520	560	325	410	350	500
4	880	1,950	1.310	1,740	980	780	560	520	325	380	350	445
5	780	1,430	1,250	1,620	980	880	690	462	350	350	350	445
6	780	1,200	1,200	1,550	980	780	560	410	410	350	350	445
7	735	1,080	1,140	1,550	980	880	480	880	365	325	350	780
8	735	980	1,080	1,490	1,030	880	445	930	325	325	690	560
9	690	930	1,080	1,490	1,030	830	445	580	325	325	520	462
10	735	930	3,610	1,430	1,030	780	480	480	300	325	445	445
11	780	2,090	2,970	1,620	930	735	520	395	265	300	380	445
12	1,810	3,290	1,950	1,490	930	690	735	395	300	300	380	410
13	1,200	1,680	4,100	1,430	930	690	600	600	300	300	410	410
14	930	1,370	8,080	1,430	930	645	560	1,080	300	275	380	380
15	780	1,200	9,180	1,430	880	645	520	1,200	325	265	380	445
16	780	1,140	3,850	1.370	880	600	480	735	380	275	410	410
17	780	1,080	2,740	1,310	930	600	445	480	380	275	380	410
18	980	1,030	2,230	1,310	880	600	445	410	380	325	380	410
19	880	980	2,090	1,250	880	600	410	380	380	520	350	410
20	880	1,550	1,950	1,250	930	600	410	350	350	500	380	410
21	880	1,430	3,290	1,200	880	600	445	380	520	395	350	410
22	780	1,550	2,300	1,200	880	690	410	380	462	350	350	410
23	780	1,310	1,880	1,200	3,770	645	520	480	410	350	380	480
24	1,310	1,200	1,810	1,140	1,680	600	580	410	380	780	350	500
25	1,550	1,080	1,745	1,140	1,080	600	1,310	380	338	600	350	690
26	1,310	1,080	1,880	1,140	930	560	1,490	350	300	445	350	780
27	5,590	4,940	7,200	1,200	930	560	2,160	350	275	428	325	600
28	2,300	3,610	3,450	1,200	930	830	1,030	350	275	410	325	480
29	1,490	.....	2,440	1,140	880	930	780	645	830	380	338	735
30	1,250	.....	2,300	1,140	830	830	690	520	1,740	380	380	1,080
31	1,250	.....	2,090	.....	780	.....	600	380	.....	380	.....	930

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of Etowah River near Ball Ground, Ga., for 1913.

[Drainage area, 466 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	5,590	690	1,170	2.51	2.89	A.
February	4,960	930	1,580	3.39	3.53	A.
March	9,180	1,080	2,770	5.94	6.85	A.
April	1,950	1,140	1,400	3.00	3.35	A.
May	3,770	780	1,060	2.27	2.62	A.
June	980	560	722	1.55	1.73	B.
July	2,160	410	661	1.42	1.64	B.
August	1,200	350	538	1.15	1.33	B.
September	1,740	265	410	.880	.98	B.
October	780	265	394	.845	.97	B.
November	690	325	381	.818	.91	B.
December	1,080	380	547	1.17	1.35	B.
The year	9,180	265	967	2.08	28.15	

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ETOWAH RIVER NEAR ROME, GA.

Location.—At Freemans Ferry, 5 miles above Rome, Ga., where Etowah and Oostanaula rivers unite to form Coosa River; 1 mile below mouth of Dikes Creek.

Records available.—August 17, 1904, to December 31, 1913.

Drainage area.—1,800 square miles.

Gage.—Vertical gage in three sections, on left bank 250 feet below the ferry; read twice each day.

Channel.—Both banks subject to overflow during high water.

Discharge measurements.—Made from ferryboat or from a small boat held in place by ferry cable. No measurements can be made at high stages.

Regulation.—The operation of the few milldams above will seldom affect the flow.

Accuracy.—Conditions of flow are probably permanent; rating curve excellent for low and medium stages.

No discharge measurements have been made since 1911.

Daily gage height, in feet, of Etowah River near Rome, Ga., for 1913.

[R. M. Pattillo, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	3.8	9.0	4.8	3.1	3.6	2.45	2.5	1.9	3.8	1.9	2.6
2	2.4	3.8	5.2	4.4	3.0	3.2	2.25	3.4	1.9	2.8	1.9	3.0
3	3.4	3.8	4.5	4.2	3.0	3.0	2.15	3.0	1.85	2.35	1.9	2.6
4	3.5	6.4	4.1	4.2	3.0	2.8	2.1	2.6	1.8	2.15	1.85	2.25
5	3.0	6.0	3.8	4.1	2.9	2.7	2.0	2.15	1.8	2.0	1.85	2.1
6	2.9	4.8	3.8	4.0	2.9	2.7	2.2	3.0	1.8	1.9	1.8	2.05
7	2.8	3.8	3.6	4.0	3.0	3.0	2.25	4.4	1.95	1.85	1.9	2.05
8	2.8	3.6	3.5	3.8	3.0	3.0	2.1	4.2	1.8	1.85	2.2	2.1
9	2.8	3.4	3.4	3.7	3.0	2.9	2.05	3.4	1.8	1.8	2.35	2.0
10	2.8	3.4	6.0	3.5	2.9	2.8	2.0	2.8	2.2	1.8	2.15	2.0
11	2.8	4.0	7.3	4.0	2.9	2.7	2.0	2.15	2.1	1.75	2.0	2.0
12	2.9	11.6	5.6	3.8	2.9	2.6	2.1	1.95	1.85	1.75	2.0	2.0
13	4.0	8.6	7.2	3.7	2.8	2.5	2.6	2.0	1.8	1.75	1.95	1.95
14	3.4	5.3	12.8	3.6	2.8	2.5	2.9	2.6	1.8	1.7	1.9	2.0
15	3.0	4.2	16.4	3.6	2.8	2.45	2.4	2.9	1.75	1.7	1.9	2.0
16	2.9	4.0	15.2	3.5	3.0	2.4	2.15	3.0	1.7	1.7	1.85	2.0
17	2.8	3.9	10.0	3.5	3.0	2.35	2.0	2.7	1.7	1.7	1.9	1.95
18	3.0	3.8	7.2	3.4	2.9	2.35	1.95	2.35	1.7	1.65	1.85	1.95
19	3.3	3.6	6.2	3.4	2.8	2.3	1.9	2.05	1.95	1.7	1.85	1.95
20	3.1	3.6	5.2	3.3	2.7	2.3	2.1	1.95	2.05	1.9	1.85	1.95
21	3.0	4.0	6.2	3.3	2.6	2.25	2.6	1.9	2.2	2.0	1.8	2.0
22	3.0	4.0	7.8	3.2	2.8	2.5	2.35	1.9	2.2	1.9	1.8	2.0
23	2.9	3.8	7.2	3.1	3.2	2.8	2.15	2.45	2.0	1.9	1.8	2.0
24	2.8	3.5	5.6	3.1	4.4	2.7	2.0	2.15	1.9	2.1	1.8	2.0
25	4.4	3.4	4.8	3.1	3.8	2.6	3.0	2.0	1.9	2.25	1.8	2.3
26	4.8	3.3	5.2	3.1	3.2	2.5	6.2	2.0	1.8	2.15	1.8	2.9
27	9.9	5.4	10.6	3.0	3.0	2.4	6.3	1.95	1.8	2.0	1.8	2.5
28	14.0	12.5	12.7	3.1	2.9	2.4	5.4	1.9	1.7	1.95	1.75	2.2
29	7.4	.....	7.2	3.2	2.8	2.3	3.4	1.95	1.9	1.9	1.75	2.35
30	3.8	.....	5.2	3.1	2.7	2.7	3.0	2.1	5.8	1.9	1.9	3.2
31	3.9	.....	4.8	.....	3.0	.....	2.6	1.95	.....	1.9	.....	3.2

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Daily discharge, in second-feet, of Etowah River near Rome, Ga., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,660	3,640	13,000	5,440	2,490	3,300	1,600	1,660	990	3,640	990	1,790
2	1,540	3,640	6,160	4,720	2,340	2,640	1,360	2,960	990	2,060	990	2,340
3	2,960	3,640	4,900	4,360	2,340	2,340	1,250	2,340	942	1,480	990	1,790
4	3,130	8,320	4,180	4,360	2,340	2,060	1,200	1,790	895	1,250	942	1,360
5	2,340	7,600	3,640	4,180	2,200	1,920	1,090	1,250	895	1,090	942	1,200
6	2,200	5,440	3,640	4,000	2,200	1,920	1,300	2,340	895	990	895	1,140
7	2,060	3,640	3,300	4,000	2,340	2,340	1,360	4,720	1,040	942	895	1,140
8	2,060	3,300	3,130	3,640	2,340	2,340	1,200	4,360	895	942	1,300	1,200
9	2,060	2,960	2,960	3,470	2,340	2,200	1,140	2,960	895	895	1,480	1,090
10	2,060	2,960	7,600	3,130	2,200	2,060	1,090	2,060	1,300	895	1,250	1,090
11	2,060	4,000	9,940	4,000	2,200	1,920	1,090	1,250	1,200	848	1,090	1,090
12	2,200	17,700	6,880	3,640	2,200	1,790	1,200	1,040	942	848	1,090	1,090
13	4,000	12,300	9,760	3,470	2,060	1,660	1,790	1,090	895	848	1,040	1,040
14	2,960	6,340	21,600	3,300	2,060	1,660	2,200	1,790	895	800	990	1,090
15	2,340	4,360	26,300	3,300	2,060	1,600	1,540	2,200	848	800	990	1,090
16	2,200	4,000	24,200	3,130	2,340	1,540	1,250	2,340	800	800	942	1,090
17	2,060	3,820	14,800	3,130	2,340	1,480	1,090	1,920	800	800	990	1,040
18	2,340	3,640	9,760	2,960	2,200	1,480	1,040	1,480	800	755	942	1,040
19	2,800	3,300	7,960	2,960	2,060	1,420	990	1,140	1,040	800	942	1,040
20	2,490	3,300	6,160	2,800	1,920	1,420	1,200	1,040	1,140	990	942	1,040
21	2,340	4,000	7,960	2,800	1,790	1,360	1,790	990	1,300	1,090	895	1,090
22	2,340	4,000	10,800	2,640	2,060	1,660	1,480	990	1,300	990	895	1,090
23	2,200	3,640	9,760	2,490	2,640	2,060	1,250	1,600	1,090	990	895	1,090
24	2,060	3,130	6,880	2,490	4,720	1,920	1,090	1,250	990	1,200	895	1,090
25	4,720	2,960	5,440	2,490	3,640	1,790	2,340	1,090	990	1,360	895	1,420
26	5,440	2,800	6,160	2,490	2,640	1,660	7,960	1,090	895	1,250	895	2,200
27	14,600	6,520	15,900	2,340	2,340	1,540	8,140	1,040	895	1,090	895	1,660
28	22,000	19,300	19,700	2,490	2,200	1,540	6,520	990	800	1,040	848	1,360
29	10,100	.....	9,760	2,640	2,060	1,420	2,960	1,040	990	990	848	1,480
30	3,640	.....	6,160	2,490	1,920	1,920	2,340	1,200	7,240	990	990	2,640
31	3,820	.....	5,440	.....	2,340	.....	1,790	1,040	-----	990	.....	2,640

NOTE.—Daily discharge determined from a rating curve well defined below 4,000 second-feet based on measurements made previous to 1912. Above 6,000 second-feet the rating curve is an extension. As the accuracy of this curve depends on the permanence of the discharge relation, estimates of daily discharge should be used with caution.

Monthly discharge of Etowah River near Rome, Ga., for 1913.

[Drainage area, 1,800 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	22,000	1,540	3,900	2.17	2.50	B.
February	19,300	2,800	5,510	3.06	3.19	B.
March	26,300	2,960	9,480	5.27	6.08	C.
April	5,440	2,340	3,310	1.84	2.05	A.
May	4,720	1,790	2,350	1.31	1.51	A.
June	3,300	1,360	1,870	1.04	1.16	A.
July	8,140	990	2,050	1.14	1.31	A.
August	4,720	990	1,740	.967	1.11	A.
September	7,240	800	1,190	.661	.74	A.
October	3,640	755	1,110	.617	.71	A.
November	1,480	848	986	.548	.61	A.
December	2,640	1,040	1,370	.761	.88	A.
The year	26,300	755	2,900	1.61	21.85	

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AMICALOLA RIVER NEAR POTTS MOUNTAIN, GA.

Location.—At a covered wagon bridge known as Steeles Bridge, 2 miles east of Potts Mountain post office, and a quarter of a mile above the mouth of Holley Creek; 15 miles from Ball Ground, Ga., the nearest railroad station.

Records available.—June 21, 1907, to December 31, 1908; June 7, 1910, to December 31, 1913.

Drainage area.—80 square miles.

Gage.—Vertical staff attached to a tree on the left bank 30 feet below bridge.

Channel and control.—Rocky and permanent at station, but may shift at a bar of small bowlders a short distance below.

Discharge measurements.—Made from wagon bridge or by wading at low stages.

No discharge measurements have been made since 1911, and because of this fact and the possibility of change in discharge relation, estimates of discharge for 1913 are withheld.

Daily gage height, in feet, of Amicalola River near Potts Mountain, Ga., for 1913.

[J. A. Whitmore, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	1.8	2.2	2.3	1.9	1.95	1.8	1.8	.....	1.4	1.2	1.1
2	1.5	1.8	2.1	2.25	1.9	1.95	1.8	1.8	.....	1.4	1.2	1.1
3	1.5	4.0	2.0	2.2	1.9	2.5	1.8	1.8	.....	1.4	1.2	1.1
4	1.5	2.5	2.0	2.2	1.9	2.1	1.8	1.75	.....	1.4	1.2	1.1
5	1.5	2.1	1.95	2.2	1.9	2.0	1.95	1.75	.....	1.35	1.2	1.1
6	1.6	2.0	1.9	2.15	1.9	2.0	1.9	1.7	.....	1.35	1.2	1.1
7	1.8	1.9	1.9	2.15	1.9	2.1	1.85	1.7	1.5	1.35	1.2	1.25
8	1.8	1.85	1.9	2.1	1.95	3.2	1.8	1.7	1.5	1.35	1.2	1.2
9	1.8	1.8	1.9	2.1	2.1	2.2	1.8	1.7	1.5	1.35	1.15	1.2
10	1.9	1.8	3.0	2.0	2.0	2.1	1.75	1.65	1.5	1.35	1.15	1.15
11	1.9	2.9	3.1	2.0	2.0	2.0	1.9	1.65	1.5	1.35	1.15	1.15
12	2.5	2.6	2.4	2.0	1.95	1.95	1.9	1.65	1.5	1.35	1.15	1.15
13	1.9	2.4	2.5	2.0	1.95	1.95	1.8	1.75	1.5	1.35	1.15	1.15
14	1.9	2.0	11.0	2.05	1.95	1.95	1.8	1.7	1.5	1.35	1.15	1.15
15	1.8	1.9	9.0	2.0	1.95	1.95	1.75	1.7	1.5	1.35	1.15	1.25
16	1.8	1.85	3.0	2.0	2.0	1.9	1.75	1.7	1.5	1.35	1.15	1.15
17	1.8	1.8	2.9	2.0	2.1	1.9	1.7	1.65	1.5	1.35	1.1	1.15
18	1.9	1.8	2.7	2.0	2.0	1.85	1.7	1.65	1.5	1.35	1.1	1.15
19	1.8	1.8	2.6	2.0	2.0	1.85	1.7	1.6	1.5	1.3	1.1	1.15
20	1.7	5.0	2.4	2.0	2.0	1.85	1.7	1.6	1.5	1.3	1.1	1.15
21	1.7	2.25	3.5	1.9	1.95	1.8	1.7	1.6	1.45	1.3	1.1	1.15
22	1.7	2.0	2.9	1.9	1.95	1.8	1.65	1.55	1.45	1.3	1.1	1.25
23	1.8	1.85	2.6	1.9	3.0	1.8	1.65	1.55	1.45	1.3	1.1	1.25
24	1.9	1.8	2.4	1.9	2.5	1.8	1.65	.....	1.45	1.25	1.1	1.3
25	1.9	1.8	2.2	1.9	2.1	1.8	1.75	.....	1.45	1.25	1.05	1.35
26	1.85	1.8	2.2	1.9	2.1	1.8	1.75	.....	1.45	1.25	1.05	1.35
27	4.0	3.6	7.0	1.9	2.0	1.9	1.8	.....	1.45	1.25	1.05	1.35
28	2.2	2.5	3.0	2.0	2.0	1.9	1.8	.....	1.45	1.25	1.05	1.4
29	2.0	.....	2.6	2.0	1.95	1.85	1.8	.....	1.45	1.25	1.05	1.5
30	1.8	.....	2.4	1.95	1.95	1.8	1.75	.....	1.45	1.2	1.1	1.5
31	1.8	.....	2.4	.....	1.9	.....	1.75	.....	.....	1.2	.....	2.0

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TALLAPOOSA RIVER AT STURDEVANT, ALA.

Location.—At the Central of Georgia Railway bridge a quarter of a mile west of Sturdevant, Ala., and 5 miles below mouth of Hillabee Creek.

Records available.—July 19, 1900, to December 31, 1913.

Drainage area.—2,460 square miles.

Gage.—A vertical staff gage on right bank of river about 2,000 feet above bridge. The original gage was a staff in two sections attached to pier of railroad bridge. A standard chain gage installed July 10, 1905, was read until summer of 1906, when present gage was installed. The readings of new staff gage are all corrected to agree with readings of standard chain gage referred to its original datum at railroad bridge.

Channel and control.—Rocky and permanent; one side deep and sluggish at low stage. Both banks overflow for about 200 feet at extreme high stages. Control, a rocky ledge across river just below bridge.

Discharge measurements.—Made from a plank walk resting on the lower members of the deck railroad bridge. Some low-water measurements made from boat.

Regulation.—The flow is under no artificial control except at a number of small mills a great distance upstream.

Accuracy.—A good rating has been developed and excellent results secured at this station.

No discharge measurements made since 1911.

Daily gage height, in feet, of Tallapoosa River at Sturdevant, Ala., for 1913.

[C. J. Stowe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	6.0	7.3	5.1	3.1	2.4	3.2	2.0	2.3	4.9	1.6	1.8
2	3.2	4.7	5.6	4.8	3.0	2.3	2.8	2.7	2.3	3.6	1.5	2.0
3	3.5	6.3	4.7	4.5	3.0	3.0	2.2	3.4	1.6	2.5	1.45	3.6
4	3.7	8.3	4.1	4.5	3.0	4.1	2.0	2.9	1.8	2.0	1.45	3.0
5	3.6	6.8	4.1	4.3	2.9	3.0	2.0	2.2	2.2	1.6	1.4	2.3
6	3.3	5.5	4.0	4.2	2.8	4.0	1.7	1.9	2.0	1.35	1.35	2.2
7	3.0	4.5	3.9	4.1	2.8	6.8	1.7	1.7	2.4	1.15	1.45	2.5
8	3.1	4.1	3.8	4.1	2.8	5.5	1.6	1.5	1.7	1.15	1.35	2.3
9	3.4	3.9	3.7	4.0	2.9	4.8	1.4	2.0	1.3	1.05	1.45	2.2
10	3.2	3.8	8.6	4.0	2.9	4.0	1.4	1.8	1.15	1.05	1.45	2.0
11	3.0	3.7	9.2	4.5	2.9	3.4	2.0	1.7	2.9	1.0	1.4	1.9
12	4.1	4.0	7.7	4.3	2.8	3.0	4.0	2.0	2.2	.9	1.35	1.8
13	4.8	5.2	11.2	4.1	2.7	2.7	5.0	1.7	1.8	.85	1.35	1.7
14	4.3	4.6	12.5	4.0	2.7	2.5	3.6	1.35	1.4	.8	1.35	1.7
15	3.6	4.0	11.6	3.9	2.6	2.4	2.8	1.2	1.25	.75	1.35	1.9
16	3.2	3.8	9.0	3.8	2.5	2.3	2.7	2.3	1.25	.7	1.35	1.9
17	3.0	3.6	6.9	3.7	3.5	2.2	2.3	2.5	1.5	.7	1.35	1.8
18	3.0	3.5	5.8	3.6	3.4	2.2	2.0	1.9	1.45	1.2	1.45	1.8
19	3.4	3.4	5.2	3.5	3.0	2.1	1.7	1.6	1.35	3.1	1.45	1.7
20	3.4	4.0	5.0	3.5	2.8	2.0	1.7	1.3	1.5	3.4	1.45	1.7
21	3.2	4.3	7.3	3.4	2.7	1.9	3.0	1.15	1.7	2.8	1.45	1.7
22	3.0	5.5	8.6	3.3	2.6	2.0	2.3	1.0	2.1	2.4	1.35	1.7
23	3.0	4.7	6.7	3.2	4.0	2.2	2.7	1.25	1.7	2.5	1.35	1.7
24	3.5	4.1	5.6	3.2	5.1	2.1	3.0	2.0	1.6	3.9	1.35	1.7
25	6.7	3.9	5.0	3.2	4.3	2.0	3.1	1.7	1.4	3.4	1.25	2.0
26	5.6	3.7	4.9	3.4	3.6	1.8	2.9	1.1	1.2	2.9	1.25	2.7
27	13.3	5.7	11.8	3.5	3.0	1.7	2.5	1.3	1.1	2.4	1.25	2.2
28	13.3	7.4	9.2	3.5	2.7	1.7	2.2	1.0	.95	2.2	1.35	2.0
29	9.4	.....	7.8	3.4	2.5	1.8	2.9	.9	.95	1.8	1.45	3.6
30	7.1	.....	6.6	3.2	2.4	2.0	2.7	1.2	2.7	1.7	1.4	3.8
31	6.5	.....	6.0	.....	2.3	.....	2.2	2.2	.....	1.7	.....	3.8

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Daily discharge, in second-feet, of Tallapoosa River at Sturdevant, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,430	9,440	13,300	7,020	2,960	2,020	3,110	1,560	1,900	6,500	1,180	1,360
2	3,110	6,010	8,330	6,250	2,810	1,900	2,530	2,400	1,900	3,770	1,100	2,810
3	3,600	10,300	6,010	5,550	2,810	2,810	1,780	3,430	1,180	2,140	1,060	2,810
4	3,950	16,500	4,710	5,550	2,810	4,710	1,560	2,670	1,360	1,560	1,060	2,810
5	3,770	11,700	4,710	5,120	2,670	2,810	1,560	1,780	1,780	1,180	1,020	1,900
6	3,270	8,060	4,510	4,910	2,530	4,510	1,270	1,460	1,560	985	985	1,780
7	2,810	5,550	4,320	4,710	2,530	11,700	1,270	1,270	2,020	848	1,060	2,140
8	2,960	4,710	4,130	4,710	2,530	8,060	1,180	1,160	1,270	848	985	1,900
9	3,430	4,320	3,950	4,510	2,670	6,250	1,020	1,560	950	782	1,060	1,780
10	3,110	4,130	17,500	4,510	2,670	4,510	1,020	1,360	848	782	1,060	1,560
11	2,810	3,950	19,400	5,550	2,670	3,430	1,560	1,270	2,670	750	1,020	1,460
12	4,710	4,510	14,600	5,120	2,530	2,810	4,510	1,560	1,780	690	985	1,360
13	6,250	7,280	25,800	4,710	2,400	2,400	6,760	1,270	1,360	662	985	1,270
14	5,120	5,770	30,000	4,510	2,400	2,140	3,770	985	1,020	635	985	1,270
15	3,770	4,510	27,100	4,320	2,270	2,020	2,530	880	915	608	985	1,460
16	3,110	4,130	18,800	4,130	2,140	1,900	2,400	1,900	915	580	985	1,460
17	2,810	3,770	12,000	3,950	3,600	1,780	1,900	2,140	1,100	580	985	1,360
18	2,810	3,600	8,880	3,770	3,430	1,780	1,560	1,460	1,060	880	1,060	1,360
19	3,430	3,430	7,280	3,600	2,810	1,670	1,270	1,180	985	2,960	1,060	1,270
20	3,430	4,510	6,760	3,600	2,530	1,560	1,270	950	1,100	3,430	1,060	1,270
21	3,110	5,120	13,300	3,430	2,400	1,460	2,810	848	1,270	2,530	1,060	1,270
22	2,810	8,060	17,500	3,270	2,270	1,560	1,900	750	1,670	2,020	985	1,270
23	2,810	6,010	11,400	3,110	4,510	1,780	2,400	915	1,270	2,140	985	1,270
24	3,600	4,710	8,330	3,110	7,020	1,670	2,810	1,560	1,180	4,320	985	1,270
25	11,400	4,320	6,760	3,110	5,120	1,560	2,960	1,270	1,020	3,430	915	1,560
26	8,330	3,950	6,500	3,430	3,770	1,360	2,670	815	880	2,670	915	1,780
27	32,500	8,600	27,700	3,600	2,810	1,270	2,140	950	815	2,020	915	1,780
28	32,500	13,600	19,400	3,600	2,400	1,270	1,780	750	720	1,780	985	1,560
29	20,000	.....	14,900	3,430	2,140	1,360	2,670	690	720	1,360	1,060	3,770
30	12,700	.....	11,100	3,110	2,020	1,560	2,400	880	2,400	1,270	1,020	4,130
31	10,800	.....	9,440	.....	1,900	.....	1,780	1,780	.....	1,270	.....	4,130

NOTE.—Daily discharge determined from a rating curve well defined by measurements made previous to 1912.

Monthly discharge of Tallapoosa River at Sturdevant, Ala., for 1913.

[Drainage area, 2,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	32,500	2,810	6,850	2.74	3.16	A.
February	16,500	3,430	6,450	2.58	2.69	A.
March	30,000	3,950	12,500	5.00	5.76	A.
April	7,020	3,110	4,310	1.72	1.92	A.
May	7,020	1,900	2,910	1.16	1.34	A.
June	11,700	1,270	2,850	1.14	1.27	A.
July	6,760	1,020	2,260	.904	1.04	A.
August	3,430	690	1,400	.560	.65	A.
September	2,670	720	1,320	.528	.59	A.
October	6,500	580	1,810	.724	.83	A.
November	1,180	915	1,020	.408	.46	A.
December	4,130	1,270	1,880	.752	.87	A.
The year	32,500	580	3,790	1.52	20.58	

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LITTLE TALLAPOOSA RIVER NEAR WEDOWEE, ALA.

Location.—Six miles northwest of Wedowee, Ala., and about 4 miles above mouth. Wedowee Creek enters from the south about 2 miles above station.

Records available.—August 29, to December 31, 1913. Three discharge measurements were made in 1904 and referenced to a datum 0.22 foot lower than that of the present gage.

Drainage area.—Not measured.

Gage.—Vertical staff.

Channel and control.—Probably slightly shifting. Control a rock ledge extending across the river about 1,000 feet below gage.

Point of zero flow.—At about gage height −0.5 foot.

Discharge measurements.—Made from a single span highway bridge about 20 feet below gage.

Regulation.—Considerable fluctuation caused by small mills some distance above.

Data insufficient for estimate of daily discharge.

The following discharge measurement was made by Warren E. Hall:
August 29, 1913: Gage height, 0.58 foot; discharge, 165 second-feet.

Daily gage height, in feet, of Little Tallapoosa River near Wedowee, Ala., for 1913.

[Elbert Cummings, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.0	2.05	1.0	2.0	16	.....	1.05	0.8	0.85	1.4
2	.....	1.6	1.65	.9	2.6	17	.....	1.1	.65	.95	1.35
3	.....	1.15	1.05	.95	1.8	18	.....	1.15	1.0	.85	1.35
4	.....	1.1	1.05	.95	2.7	19	.....	1.15	2.75	.9	1.0
5	.....	1.2	1.55	.9	1.95	20	.....	1.0	2.1	.85	1.0
6	.....	1.2	1.7	.85	1.65	21	.....	1.1	1.2	.8	1.15
7	.....	1.0	2.05	.9	2.4	22	.....	1.2	1.35	.85	1.0
8	.....	1.6	1.05	1.0	1.25	23	.....	1.0	1.25	.9	.95
9	.....	2.35	1.05	1.05	1.0	24	.....	1.0	2.85	.8	.9
10	.....	2.0	1.0	1.05	1.4	25	.....	1.1	2.25	.85	1.06
11	.....	1.1	1.0	.95	1.2	26	.....	1.0	1.65	.9	.9
12	.....	1.05	1.0	.9	1.0	27	.....	1.0	1.3	.8	.85
13	.....	1.05	1.05	.85	1.0	28	.....	2.05	1.15	.9	1.15
14	.....	1.05	1.1	.85	1.7	29	0.7	1.65	1.2	.9	2.0
15	.....	1.15	1.0	.9	1.4	30	.....	1.05	1.15	1.0	2.45
						31	1.0	.....	1.05	.....	2.5

TOMBIGBEE RIVER AT EPES, ALA.

Location.—At the Alabama Great Southern Railroad bridge just below the mouth of Jones Creek, about half a mile from Epes, Ala.

Records available.—1900 to 1901 (discharge measurements were made by the United States Geological Survey and a rating was developed for those years); November 29, 1904, to August 31, 1913. A record of approximate gage heights, based on a gage painted on one of the bridge piers, has been kept by the Alabama Great Southern Railroad for a number of years.

Drainage area.—8,830 square miles.

Gage.—Standard chain gage attached to the railroad bridge.

Channel and control.—At flood stages—gage heights of 38 feet and over—the left bank overflows for about seven-eighths of a mile under the trestle approach to the bridge. Some changes in section have probably occurred since the station was established.

Discharge measurements.—Made from downstream side of railroad bridge.

Accuracy.—Good results have been obtained at this station in the years when sufficient discharge measurements were made to determine the rating curve.

No discharge measurements made since 1911.

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Daily gage height, in feet, of Tombigbee River at Epes, Ala., for 1913.

[George Haven, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	18.7	40.2	33.4	27.2	5.6	7.0	1.8	2.8
2	18.4	40.5	36.3	26.8	5.2	6.2	2.0	2.8
3	19.5	41.4	38.2	25.3	4.8	5.4	2.2	3.6
4	20.2	42.2	39.6	25.1	4.6	4.4	2.6	3.4
5	20.5	42.6	40.8	27.3	4.4	4.0	3.7	3.2
6	20.0	42.4	41.6	26.9	4.2	4.0	3.9	2.9
7	20.0	41.9	42.2	25.5	4.0	4.0	3.4	2.5
8	21.0	40.5	42.5	24.0	3.8	4.6	2.8	2.2
9	21.5	37.8	42.3	23.1	3.8	6.6	2.4	1.9
10	22.6	34.0	43.1	22.3	4.2	6.4	2.2	1.8
11	23.6	28.0	42.2	19.6	4.2	6.0	2.0	1.6
12	26.6	27.1	40.8	16.2	4.0	5.6	1.8	1.5
13	28.7	29.8	40.4	15.6	3.8	5.0	2.2	1.4
14	30.0	32.0	40.4	16.4	3.6	4.4	2.7	1.3
15	30.9	33.7	40.6	17.2	3.6	3.8	4.8	1.3
16	31.2	34.6	40.6	15.8	3.6	3.4	5.6	1.3
17	30.6	36.2	40.2	13.8	3.6	3.0	4.2	1.3
18	31.4	37.0	39.7	12.0	3.8	2.8	3.2	1.3
19	31.1	37.6	39.2	10.8	4.2	2.6	2.7	1.3
20	30.2	37.6	39.0	10.0	4.6	2.5	2.4	1.2
21	29.4	35.9	39.4	8.9	5.0	2.4	2.0	1.4
22	28.4	32.7	39.8	7.8	9.0	2.3	1.8	1.4
23	27.6	28.4	39.8	7.0	23.0	2.2	2.2	1.3
24	28.9	24.2	39.2	6.6	27.0	2.1	1.8	1.2
25	31.0	20.1	37.6	6.0	28.1	2.0	2.0	1.2
26	31.1	16.6	35.6	5.8	27.2	2.0	2.6	1.2
27	35.2	19.4	34.0	5.6	24.2	1.9	2.3	1.2
28	37.0	28.6	31.8	5.7	19.0	1.8	2.2	1.4
29	38.0	.....	29.8	5.8	14.3	1.8	2.8	1.4
30	38.6	.....	28.4	5.8	10.6	1.8	3.3	1.4
31	39.6	.....	27.6	.....	8.0	.....	3.0	1.2

Daily discharge, in second-feet, of Tombigbee River at Epes, Ala., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	18,300	40,600	33,600	27,100	4,890	6,220	1,530	2,330
2	18,000	40,900	36,600	26,700	4,510	5,460	1,680	2,330
3	19,100	41,900	38,500	25,100	4,130	4,700	1,840	3,040
4	19,800	42,700	40,000	24,900	3,940	3,760	2,160	2,860
5	20,100	43,100	41,300	27,200	3,760	3,400	3,130	2,680
6	19,600	42,900	42,100	26,800	3,580	3,400	3,310	2,420
7	19,600	42,400	42,700	25,300	3,400	3,400	2,860	2,080
8	20,700	40,900	43,000	23,800	3,220	3,940	2,330	1,840
9	21,200	38,100	42,800	22,800	3,220	5,840	2,000	1,600
10	22,300	34,200	43,600	22,000	3,580	5,650	1,840	1,530
11	23,400	27,900	42,700	19,200	3,580	5,270	1,680	1,380
12	26,500	27,000	41,300	15,700	3,400	4,890	1,530	1,310
13	28,700	29,800	40,800	15,000	3,220	4,320	1,840	1,240
14	30,000	32,100	40,800	15,900	3,040	3,760	2,240	1,170
15	31,000	33,900	41,000	16,700	3,040	3,220	4,130	1,170
16	31,300	34,800	41,000	15,300	3,040	2,860	4,890	1,170
17	30,600	36,500	40,600	13,200	3,040	2,500	3,580	1,170
18	31,500	37,300	40,100	11,300	3,220	2,330	2,680	1,170
19	31,200	37,900	39,600	10,100	3,580	2,160	2,240	1,170
20	30,200	37,900	39,400	9,220	3,940	2,080	2,000	1,100
21	29,400	36,200	39,800	8,100	4,320	2,000	1,680	1,240
22	28,400	32,800	40,200	7,000	8,200	1,920	1,530	1,240
23	27,500	28,400	40,200	6,220	22,700	1,840	1,840	1,170
24	28,900	24,000	39,600	5,840	26,900	1,760	1,530	1,100
25	31,100	19,700	37,900	5,270	28,000	1,680	1,680	1,100
26	31,200	16,100	35,800	5,080	27,100	1,680	2,160	1,100
27	35,400	19,000	34,200	4,890	24,000	1,600	1,920	1,100
28	37,300	28,600	31,900	4,980	18,600	1,530	1,840	1,240
29	38,300	.....	29,800	5,080	13,700	1,530	2,330	1,240
30	39,000	.....	28,400	5,080	9,840	1,530	2,770	1,240
31	40,000	.....	27,500	.....	7,200	.....	2,500	1,100

NOTE.—Daily discharge determined from a rating curve fairly well defined by measurements made previous to 1912; because of the possibility of change in discharge relation estimates of daily discharge should be used with caution.

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Monthly discharge of Tombigbee River at Epes, Ala., for 1913.

[Drainage area, 8,830 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	40,000	18,000	27,700	3.14	3.62	C.
February	43,100	16,100	33,800	3.83	3.99	C.
March	43,600	27,500	38,600	4.37	5.04	C.
April	27,200	4,890	15,000	1.70	1.90	C.
May	28,000	3,040	8,450	.957	1.10	B.
June	6,220	1,530	3,210	.364	.41	B.
July	4,890	1,530	2,300	.260	.30	B.
August	3,040	1,100	1,540	.174	.20	B.

PEARL RIVER BASIN.

PEARL RIVER AT JACKSON, MISS.

Location.—At county highway bridge at Jackson, one-eighth mile above Alabama & Vicksburg Railway bridge; about 5 miles above mouth of Richland Creek.

Records available.—June 24, 1901, to December 31, 1913.

Drainage area.—3,120 square miles.

Gage.—Standard chain gage attached to highway bridge.

Channel.—Channel is somewhat obstructed by old piles. Right bank high and does not overflow. Left bank is of clear ground and overflows for several hundred feet at a stage of about 20 feet.

Discharge measurements.—Made from highway bridge.

Regulation.—Flow is subject to little or no regulation above or near station.

Accuracy.—Some slight changes in controlling section may affect accuracy of low-water estimates.

Cooperation.—Gage heights are furnished by the United States Weather Bureau.

No discharge measurements made since 1911; because of this fact and the possibility of change in discharge relation, estimates for 1913 are withheld.

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Daily gage height, in feet, of Pearl River at Jackson, Miss., for 1913.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.4	27.3	20.8	18.0	6.3	9.5	1.2	5.4	0.8	8.5	1.8	2.0
2	17.5	27.6	21.6	17.1	5.8	8.1	1.1	6.5	.8	8.6	1.7	2.5
3	17.1	28.7	22.4	16.2	5.3	7.0	1.3	7.0	.8	9.5	1.6	2.9
4	16.6	28.9	22.8	16.1	4.9	6.4	1.4	6.8	.8	8.5	1.5	3.7
5	16.1	28.8	22.8	17.8	4.5	6.0	1.3	6.4	.8	6.7	1.4	4.2
6	15.6	28.5	23.0	17.8	4.2	5.3	2.0	5.7	.8	4.3	1.3	4.5
7	15.6	27.9	23.5	17.5	4.0	4.4	2.3	4.7	.8	3.9	1.3	4.4
8	16.4	27.2	24.0	16.8	3.7	3.6	1.7	3.8	.8	3.5	1.2	4.3
9	16.9	26.4	24.2	16.1	3.3	3.1	1.4	3.1	.8	3.4	1.1	4.2
10	16.9	25.5	25.7	16.7	3.1	3.5	1.5	3.0	.8	3.2	1.0	4.0
11	16.3	24.6	26.3	18.3	2.9	3.2	1.7	2.2	.8	2.9	1.0	3.7
12	16.1	25.6	26.2	18.7	2.8	3.4	2.4	2.0	.8	2.6	1.0	3.4
13	16.1	25.3	27.4	18.4	3.0	3.1	2.9	1.7	.7	2.3	1.0	2.9
14	16.4	24.8	28.1	17.6	2.5	2.8	3.5	1.6	.7	2.1	1.0	2.7
15	16.9	24.2	28.3	16.7	3.3	2.8	3.7	1.5	.8	1.9	1.0	2.5
16	17.1	23.2	28.6	15.6	3.0	2.8	2.9	1.5	.9	1.8	1.0	2.3
17	17.1	23.1	28.9	14.5	2.9	2.8	3.2	1.4	.9	1.6	.9	2.2
18	17.9	22.5	29.0	13.2	2.6	2.6	3.0	1.3	2.1	1.5	.9	2.1
19	19.5	22.2	29.0	11.8	3.4	2.5	1.5	1.2	4.0	1.4	.9	2.3
20	20.0	22.0	28.9	9.7	2.9	2.5	2.3	1.2	4.6	1.3	.9	2.3
21	20.1	21.7	28.8	9.0	2.8	2.5	1.9	1.2	4.7	1.2	.9	2.2
22	19.8	21.4	28.2	8.0	3.3	2.2	1.7	1.1	4.6	1.1	.9	2.3
23	19.1	20.7	27.6	7.0	6.0	2.0	1.6	1.2	5.0	1.5	.9	2.4
24	19.0	20.0	26.7	6.3	4.7	1.8	1.6	1.1	5.1	1.5	.8	2.5
25	20.0	18.6	25.7	11.6	6.1	1.6	2.1	1.0	4.7	1.4	.8	3.0
26	20.4	17.0	24.6	15.4	7.4	1.3	3.2	1.0	4.2	1.4	.8	3.5
27	23.0	16.8	23.4	14.0	7.7	1.3	5.0	.9	4.3	1.3	.8	4.3
28	24.6	20.1	22.3	12.1	8.5	1.3	4.6	.9	3.3	2.0	.8	5.5
29	25.8	.....	21.1	8.6	9.5	1.3	4.6	.8	2.2	2.2	1.0	6.0
30	26.6	.....	19.9	7.0	10.3	1.2	4.1	.8	4.5	2.1	2.7	6.7
31	27.0	.....	19.0	.....	10.3	.....	4.0	.8	.....	2.0	.....	7.3

SUMMARY OF DISCHARGE PER SQUARE MILE.

The following summary of discharge per square mile is given to allow ready comparison of relative rates of run-off from different areas in the south Atlantic and eastern Gulf of Mexico basins. It shows in a general way the seasonal distribution of run-off and the effect of snow, ground, surface, and artificial storage; but the most important fact worth noting is the almost entire lack of uniformity or agreement between any two stations. It indicates that the discharge of each stream is a law unto itself and that all projects dependent upon stream flow, if they are to be developed along the safest and most economical lines, must be based on records of stream flow collected with great care over a long series of years as near the location of the project under consideration as possible.

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Summary of discharge, in second-feet per square mile, of south Atlantic and eastern Gulf of Mexico basins for 1913.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
James River at Buchanan, Va.													
James River at Cartersville, Va.	1.21	0.78	3.00	2.54	1.83	1.30	0.64	0.60	0.34	0.67	1.32	1.03	1.27
Roanoke River at Roanoke, Va.	.70	.69	2.49	1.05	1.56	.80	.72	.39	.27	.47	.71	.75	.89
Roanoke River at Old Gaston, N. C.	.87	.60	2.43	1.34	1.16	.82	.63	.52	.76	.74	1.00	.91	.98
Yadkin River at Donnaha, N. C.					2.49	1.66	1.19	1.88	1.48	1.25	1.07	1.41	
Yadkin River near Salisbury, N. C.	1.29	1.03	3.53	1.72	1.66	.98	.76	1.43	1.21	1.09	.99	1.33	1.42
Tallulah River at Mathis, Ga.				4.62	3.38	2.61	1.93	1.48	1.20	1.12	.96	1.77	
Ocmulgee River near Jackson, Ga.	1.47	1.69	3.92	1.34	.89	1.20	.89	.86	.84	.64	.47	.74	1.25
Oconee River near Greensboro, Ga.	1.97	1.55	4.65	1.63	.88	1.15	.84	.82	.82	.86	.54	1.08	1.40
Oconee River at Fraleys Ferry, near Milledgeville, Ga.	1.29	1.47	4.15	1.48	.77	.98	.75	.75	.70	.76	.51	.76	1.20
Chattahoochee River near Norcross, Ga.	2.18	2.56	4.58	2.22	1.68	1.43	1.18	1.20	.88	.87	.74	1.07	1.71
Chattahoochee River near West Point, Ga.	2.37	2.41	4.79	1.76	1.27	1.19	1.16	.97	.62	.78	.59	.90	1.56
Flint River near Woodbury, Ga.	1.30	1.95	5.68	.98	.63	.87	1.28	.55	.56	.44	.37	.63	1.28
Flint River near Culloden, Ga.				1.02	.62	.80	.96	.58	.64	.45	.40	.61	
Flint River at Albany, Ga.	1.48	2.06	5.44	2.22	.89	.91	.86	1.02	.85	.59	.56	.67	1.46
Flint River at Bainbridge, Ga.	1.44				1.09	1.03	.91	.99	.85	.70	.68	.69	
Pea River at Pera, Ala.	1.94	2.58	6.18	2.02	.80	.86	1.48	.56					
Conecuh River at Beck, Ala.	2.32	3.40	7.83	2.26	.75	.54	1.05	.55	.80	.64	.43	.66	1.76
Oostanaula River at Resaca, Ga.	2.91	3.34	6.17	1.81	1.63	1.56	.87	.53	.45	.38	.34	.66	1.71
Coosa River at Riverside, Ala.	2.68	3.91	5.65	1.87	1.03	.90	.62	.65	.40	.59	.32	.82	1.61
Alabama River at Selma, Ala.	2.42	3.90	6.03	2.32	1.19	1.02	.78	.76	.58	.77	.44	.69	1.73
Etowah River near Ball Ground, Ga.	2.51	3.39	5.94	3.00	2.27	1.55	1.42	1.15	.88	.84	.82	1.17	2.08
Etowah River near Rome, Ga.	2.17	3.06	5.27	1.84	1.31	1.04	1.14	.97	.66	.62	.55	.76	1.61
Tallapoosa River at Sturdevant, Ala.	2.74	2.58	5.00	1.72	1.16	1.14	.90	.56	.53	.72	.41	.75	1.52
Tombigbee River at Epes, Ala.	3.14	3.83	4.37	1.70	.96	.36	.26	.17					

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